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ABSTRACT

This study addresses the extreme shortage of registered nurses (RNs) in California and the changing demographics of those entering the occupation. It focuses on the issue that racially diverse RN students have shown a significantly lower completion rate than their white counterparts. Since community colleges provide 70% of the hospital-based RN workforce, the study included 6 community colleges with associate degree nursing programs. Questionnaires were used from 211 student participants. The sample demographic was 16% male and 84% female respondents. Forty-five percent of the sample were under 26 years old and 9% were over 40. The ethnicity was as follows: 39% White Non-Hispanic, 28% Hispanic, 9% Black, 1% Native American, 13% Asian, 5% Pacific Islander, and 5% other. Thirty-two percent of the sample declared dependent children. Twenty-nine percent of the sample claimed an income lower than $20,000, while 28% reported income over $50,000. The study found that lower annual income, job hours over 20 per week, English not the native language, birthplace outside the United States, and ethnicity non-Caucasian were factors that correlated significantly with a greater risk for attrition. The study recommends that nursing candidates with low science indices, poor English fluency, and low reading scores should be provided with a concise remediation program and should be mentored consistently. Appendixes include: Consent and Human Rights Forms; Data Collection Instrument; Self-Efficacy Strength Test; Student Perceptual Appraisal; and Outcomes Inventory Form. (Contains 17 tables and approximately 175 references.) (NB)

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PREDICTING STUDENT RETENTION AND ACADEMIC ACHIEVEMENT IN WESTERN UNITED STATES ASSOCIATE DEGREE IN NURSING PROGRAMS

by

Margaret Wilson

A Dissertation Presented to the
FACULTY OF THE ROSSIER SCHOOL OF EDUCATION
UNIVERSITY OF SOUTHERN CALIFORNIA
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Requirements for the Degree
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ABSTRACT

A descriptive study of retention for associate degree nursing programs followed a sample of 211 freshman students through their first semester. Research showed significantly more variance of academic achievement explained by a science index variable including Anatomy and Physiology (A&P) grade point average (GPA) and science course repetitions. This science index was also the major variable, yielding a 78% accurate prediction for retained/nonretained student status. Study conceptual framework encompassed a broad range of in-depth student characteristics (demographic, intellective, self-efficacy, and environmental impact variables). Bandura's theory of self-efficacy and Bean and Metzner's construct of nontraditional student environmental impact were operationalized through tools created by Marianne Jeffreys. These tools were tailored to retention concerns of first-semester nursing students' concerns. Numerical grade regressed upon several independents explained thirty-two percent of variance with the model containing variables of science index (A&P GPA and the number of times student repeated science course), English Fluency, Ethnicity (Caucasian) and self-efficacy educational requirements score. Predictive discriminant analyses reflected 78% accurate classification of students toward a retained versus nonretained outcome status by the independent variables of science index, English fluency, and high school GPA. Study implications were aimed at nursing program stakeholders to implement Science Index as a significant predictor of first-semester retention success and to offer appropriate developmental, remediation and mentoring support for science skill and English fluency. Further study for students with multi-cultural impact characteristics was indicated from a composite diversity variable including Non-Caucasian Ethnicity, primary language other than English, and Birthplace outside of the United States.

Margaret Wilson Linda Sera Hagedorn, Ph.D., Chair

ABSTRACT

PREDICTING STUDENT RETENTION AND ACADEMIC ACHIEVEMENT IN WESTERN UNITED STATES ASSOCIATE DEGREE IN NURSING PROGRAMS

A descriptive study of retention for associate degree nursing programs followed a sample of 211 freshman students through their first semester. Research showed significantly more variance of academic achievement explained by a science index variable including Anatomy and Physiology (A&P) grade point average (GPA) and science course repetitions. This science index was also the major variable, yielding a 78% accurate prediction for retained/nonretained student status. Study conceptual framework encompassed a broad range of in-depth student characteristics (demographic, intellective, self-efficacy, and environmental impact variables). Bandura's theory of self-efficacy and Bean and Metzner's construct of nontraditional student environmental impact were operationalized through tools created by Marianne Jeffreys. These tools were tailored to first-semester nursing students' concerns of retention. Numerical grade regressed upon several independents explained thirty-two percent of variance with the model containing variables of science index (A&P GPA and the number of times student repeated science course), English Fluency, Ethnicity (Caucasian) and self-efficacy educational requirements score. Predictive discriminant analyses reflected 78% accurate classification of students toward a retained versus nonretained outcome status by the independent variables of science index, English fluency, and high school GPA. Study implications were aimed at nursing program stakeholders to implement Science Index as a significant predictor of first-semester retention success and to offer appropriate developmental, remediation and mentoring support for science skill and English fluency. Further study for students of multi-cultural impact was indicated from a composite diversity variable including Non-Caucasian Ethnicity, primary language other than English, and Birthplace outside of the United States.

CHAPTER 1

THE PROBLEM

This dissertation reports on a study of student nurse retention within community college associate degree in nursing (ADN) programs. There exists a shortage of registered nurses (RN) within the western United States and a decrease in RN associate degree graduates feeding the workforce pipeline. A model predicting retention through intellective, environmental impact, and self-efficacy variables for RN students was tested.

The literature review for this study builds upon a historical perspective of student retention theory, self-efficacy theory applicative to student persistence, and empirical evidence of best practices for student outcomes in higher education. The conceptual framework for this investigation incorporates intellective, environmental impact, and self-efficacy measures believed to relate to RN student persistence. The model of nontraditional student attrition by Bean and Metzner (1985) and self-efficacy theory by Bandura (1997) forms a theoretical grounding for choice of variables and instruments. The nature of demographic changes in community college students is included, considering the nontraditional/diverse nursing student who demonstrates evidence of poor retention. A voluntary sample of beginning RN students was sought at community colleges, surveyed, and followed longitudinally for one semester. Statistical procedures tested the impact of predictor variables on the criterion variables of academic achievement and RN program retention.

The overall goal of this study was to highlight those student characteristics that best relate to nursing student retention, chiefly investigating whether differences exist within the nontraditional student demographic. The hope of this researcher was to shed light on the complex problem of nursing student retention, toward the goal of improving persistence and meeting health care workforce needs.

The Problem and Its Explication

California presently is experiencing a workforce shortage of nurses, ranking this state last in RNs per 100,000 population (Schreibner, 2000). The community college provides 70% of the hospital-based RN workforce (Lopez, 1992). Identification of factors enhancing nursing student retention and academic success is now a most significant concern for nurse educators (Jeffreys, 1998). There exists a changing demographic of both traditional and nontraditional RN candidates seeking their health care career education at community colleges. Arenson (1997) compared RN students of Caucasian race to RN students of racial diversity. The racially diverse students demonstrated a significantly lower completion rate in the RN health care major than did their Caucasian counterparts. The community college nursing educator is faced with two converging and formidable problems: to meet the mission of providing sufficient numbers of safe and effective RNs into an ever-increasing health care workforce demand while decreasing attrition rates of community college RN candidates of diversity.

This was an empirical study, designed to investigate the impact of selected variables on academic achievement and retention for the current diverse community college student within the nursing major. This study seeks to answer the question: Is a predictive model of select independent variables categorized as student intellective characteristics, environmental impact characteristics, and self-efficacy score related to academic achievement and retention in the first semester of RN nursing programs?

The Background of the Problem

The background of this problem is illuminated through internal college process as well as external community impact. Clarification of the problem of nursing student retention is detailed through review of the vital role that community colleges play in the supply of RNs into the health care workforce. The external community concerns surrounding this retention problem are described by featuring the difficulties of providing effective education for health care practitioners while maintaining consumer protection during student learning experiences. Recognition of the changing demographic at both the college and the hospital further illuminates the complex nature of health care student retention.

Lopez (1992) reported that 70% of the development pipeline for the hospital-based RN workforce is accomplished through California Community Colleges. In the past, the community college mission to educate vocational workforce had been accomplished in the health care arena. Presently, there is a pattern of nursing shortage throughout the major population centers of the western United States, and community colleges are graduating fewer RN students (Schreibner, 2000). This health care worker supply and demand issue is predicted to worsen as nursing's aging workforce reaches 50% retirement over the next 15 years (Dickenson-Hazard, 2000).

Complicating the supply issue is an impending wave of health care demand by the "baby boomer" generation. This demographic group will enter its seventh decade of life and require extensive health care services, at the same time that the greater part of nurses will be retiring (Dickenson-Hazard, 2000). Jeffreys (1998) pointed out that, at a time of decreasing financial support for higher education, tuition and book costs are escalating, the admission levels of well-prepared candidates are decreasing, and nursing student attrition has risen in the country overall. The nursing numbers fall short of meeting even present health care demand. Schreibner (2000) reported that the nurse workforce supply continues to lose ground every year in California.

Neville (1993) explored student attrition issues, focusing on faculty constraints established by state-run boards of nursing for quality graduates. Neville posited that the state legislature (via Nurse Practice Act) and the consumer expect college faculty to act as a protective agent for safe care throughout the entire learning experience of RN students. Arenson (1997) wrote of students poorly prepared for application and analytic-level study, explaining that these students do not remain long in the nursing major. The clinical affiliate hospitals also demand student communication abilities that enable safe nursing education, on behalf of their clients. Both Neville and Arenson indicated that the RN student requires both academic and communication skills, employed from the beginning of program admission, to meet essential safety competencies.

The investigations by Janes (1993) determined factors that influence successful student nurse outcome, highlighting an early departure timeline. Janes stated that maximum attrition occurs within the beginning 6 weeks of the first semester. The rapid departure of RN candidates, who have waited for 1 to 2 years for limited nursing program seats, prompts early identification of factors that restrict or support academic retention (Jeffreys, 1998). To this end, data for this investigation were collected in the first few weeks of program outset to study student progress longitudinally through this early time of departure. The follow-up data collection for outcomes of academic achievement and retention data collection occurred at 8 weeks and at the end of one full semester of RN class and clinical work.

The problems of nursing student preparation, detailed by French (1989), are cognitive, academic, personal, and affective complex domains, all yielding some early level of competency. This study does not mean to imply that recognition of early RN student characteristics will solve the entire complex problem of nursing retention. Student services counselors and nursing department personnel might use these predictor categories to enhance skills and assist in remedial and developmental advisement during RN student progression. Statements by faculty and students during RN preparation emphasize self-efficacy as a necessary motivational characteristic (Jeffreys, 1998). This study includes self-efficacy as a construct to broaden this study beyond the intellective and environmental measures.

This study was designed to recognize the changing demographic of the nontraditional student, including self-appraisal of environmental impact characteristics toward the college experience, as presented by Bean and Metzner (1985). There exists an increase in diversity of clients requiring health care in most large metropolitan cities of the United States (Jeffreys & Smodlaka, 1999). This demographic change places an added need to graduate more registered nurses with similar cultural awareness and requisite language skill to meet health care client requirements. This descriptive study has a sample that is a convenience purposeful type of collection; however, the choice of six schools in the western United States aimed to include this diverse demographic.

The use of terms in this investigation such as "nontraditional student," "intellective variables," and "environmental impact variables" is a blending of terms from education and the subspecialty of health care preparation literature. The definitions of words and terms are presented in Table 1 to operationalize concepts used within this study design.

Area of Concern

The literature researched does not yield a consensus on intellective or environmental impact characteristics that best impact RN student success (Campbell & Dickson, 1996). The complexity of the issue and all possible legislative, clinical agency, college administrative, and faculty players involved with RN student retention are a maze of interconnecting affairs beyond the scope of this study. A reasonably comprehensive approach toward a model displaying intellective, environmental impact, and

Table 1

Definition and Operationalization of Key Terms

Term	Definition
Nontraditional student	RN Associate Degree student with any one of these criteria: age > 25 years, married, working > 20 hours, dependent children, male, extended family responsibilities > 8 hours a week
Traditional student	RN Associate Degree student, female, age < 26 years, no children, and none of the above marriage, work, or care criteria
Environmental impact Self-appraisal of (outside of school) obstacles to study due to **Life commitments** *Independent/Predictor*	Student's perception, scored on a Likert scale, that his/her characteristics of finances, hours of employment, encouragement outside of nursing program, family responsibilities (nuclear and extended), and hours commuted to school and clinical are restrictive or supportive to their studies (Bean & Metzner, 1987)
Environmental impact Self-appraisal of **academic ability** *Independent/Predictor*	Student's perception, scored on a Likert scale, that his/her characteristics of study hours, study skills, academic advising, absenteeism, prerequisite science course performance, and nursing entrance test performance are restrictive or supportive to nursing studies (Bean & Metzner, 1987)
Environmental impact Self-appraisal of **Background-defining variables** *Independent/Predictor*	Student's perception, scored on a Likert scale, that his/her characteristics of primary language, ethnicity, nontraditional college student status, and prior health care-related experience are restrictive or supportive to nursing studies (Bean & Metzner, 1987)
Intellective characteristics *Independent/Predictor*	Student's pre-nursing science GPA, high school GPA, Reading and Math Assessment Test score, remedial courses advised and taken, and times Anatomy & Physiology repeated
Academic achievement *Dependent/Outcome*	The continuous variable represented as a numerical grade at the completion of the first semester

Table 1 (continued)

Term	Definition
Retention/Retained *Dependent/Outcome*	Student status in the RN program of studies indicating that performance is satisfactory to enter second semester
Nonretained Dependent/Outcome	Student status in the nursing program of studies that indicates that the student will not move on to the second semester. Note: Students who self-elect to drop from the nursing major for illness, personal life demands, or dislike of the nursing major are coded to show these distinctions, respectively. Students nonretained for academic and/or clinical performance reasons are coded for these distinctions, respectively
Diverse RN students	Students claiming racial identity other than Caucasian
ESL RN students	Students stating that primary language is other than English
Community college RN student	Student accepted and actively enrolled in an allied health Registered Nursing program with class, lab, and clinical

Note. The definitions and operationalization of terms in this study are a composite of interpretation by this investigator from the literature researched and used within this study, including Jeffreys (1998), Bandura (1997), and Bean and Metzner (1985). ESL = English as a second language; RN = Registered Nurse; GPA = grade point average.

self-efficacy student characteristics was planned. Four main retention points are detailed in this next section to explicate RN student retention areas of concern: (a) open-door community college practices, (b) increasing diversity, (c) English as second language (ESL) students, and (d) nontolerance for transcultural diversity with health care providers.

The community college nursing student has increased in nontraditional attributes, as defined by Bean and Metzner (1985) and Jeffreys (1998). The RN student often has the following characteristics: age beyond 24 years, a commuter, and enmeshed in demanding familial and work responsibilities that can distract from studies (Bean & Metzner; Leovy, 1999). Community demands that limit nursing study are found in students' home, job, and extended family (Arenson, 1997). The open-door policies of California community colleges allow students who may be lacking in essential competencies to start the nursing program without remediation of basic reading, mathematics, and English language skills. The students with poor reading and English speaking skills are among the earliest to leave their "long-awaited chair" in the nursing program (Lopez, 1992).

The diversity of freshman nursing students within California has increased dramatically, reflecting African Americans, Latinos, and Asian Pacific students, with most programs of nursing full with 1- to 2-year waiting lists. This increase in diversity is not matched by a change to more pluralistic curriculum or matching demographic in faculty composition (Board of Registered Nursing [BRN], 2000; Leovy, 1999).

The ESL remediation needs of the RN student are often not addressed prior to admission due to open-door policies within community colleges in California and many other western states. These students are not retained in their first semester of nursing education due to rigorous study that demands student skills with English for auditory, reading, and speaking ability at the analytic level (Arenson, 1997). The instructor brings the freshman nursing student within a few weeks of program entry to the hospital for fundamental /basic skill practice. The hospital-based clinical environment requires assertive skillful communication in English to meet clients' nursing needs and for student academic survival with clinical course competencies.

Hospitals have a medical-dominant culture with rigid patterns of behavior for new nurses to demonstrate as the ideal standard. Students of difference may display dissimilar reactions and perceptions while attending to client needs. Transcultural tolerance for "persons of difference" is lacking among existing health care professionals for students in training as well as clients. Acculturation courses are advised prior to admission within the nursing major; however, in many states such developmental education is the student's prerogative, voluntarily attended, and it often does not reach the most at-risk students (Jeffreys & Smodlaka, 1999). This acculturation course approach implies that the student alone is the problem. This singular angle of changing the student to fit into existing rigid paradigms (in this case, the health care practitioner ideal) reflects a lack of tolerance toward global pluralism (Tierney, 1996).

Many faculty, although willing to transform curriculum for students of difference, are faced with a rigid impasse at the hospital and state regulatory levels (BRN, 1999). Collaboration and tolerance toward students of ESL, diversity, and nontraditional student difference within the hospital-based culture has been slow to happen (Lopez, 1992). In addition, fulfillment of accrediting agency standards and protection of the public, as defined in state nurse practice acts and consumer laws, complicate any changes in nursing pedagogy (BRN).

According to Lopez (1992), nontraditional nursing student needs, particularly absenteeism due to family responsibility, are not met with educational flexibility, supportive faculty, and planned curriculum adaptation. Nontraditional students, particularly those of ESL characteristic, often hit a communication brick wall and depart early in nursing course work (Henry, 1995). Their noted loss from classes affects them as well as their peers, and fear of failure overruns the freshman population, severely impacting attrition (Henry; Janes, 1993). The losses of first-semester students at southern California schools of nursing in 1999 were reported in November 1999 by the *Los Angeles Times* as a page 1 story, noting increases of 10% to 40% in nursing student attrition (as cited in Leovy, 1999). Conventional nursing program approaches and support strategies have not improved retention significantly in diverse student groups (Jeffreys & Smodlaka, 1999). Tolland (1990) studied successful outcome characteristics of nursing students and reported that married RN students with high self-esteem and self-efficacy had significantly better program outcomes than their traditional peer RN students.

Jeffreys sought student's self-efficacy through appraisal of confidence about fundamental nursing course achievement and completion. Pajares (1992, 1996) warned educators about use of vague self-efficacy testing with student samples. Pajares (1992) and Zimmerman (1990) enumerated how the self-efficacy theory can become a diluted construct in educational research when self-appraisal of efficacy is asked in nebulous broad questions. Pajares (1992, 1996), Bandura (1997), Zimmerman (1990), and Jeffreys (1998) all advised that self-appraisal for specific course competencies yielded a correlation toward educational outcome that is more reliable.

The results of a demographic profile for students were sought with intellective, environmental impact, and self-efficacy appraisal and this information was statistically related to academic achievement and retention. This research focused on the changing western United States nursing student demographics, aiming to collect a sample of both traditional and nontraditional students. In addition, the sample was intended to include a demographic of increased attendance in community colleges by Hispanic and Asian students. The complexity of the process of RN education in the community college system cannot be decisively investigated with the singular student perspective that was designed in this study. The college policies, faculty concerns, government licensing regulations, affiliate clinical hospital guidelines, and much more are important issues impinging on RN student retention and are recognized by this investigator for future research designs.

This study investigated three categories of independent/predictive variables: intellective characteristics, environmental impact characteristics, and student self-efficacy. The intellective characteristics (high school grade point average [GPA], pre-science GPA, and math and reading assessment test score) were considered as independent predictor variables of high impact in a projected model for student retention. Bean and Metzner's nontraditional student characteristics were measured and called an environmental impact predictor variable. The environmental impact variables were measured as the students' perception of how supportive or restrictive the impact of nontraditional student concerns may be in their nursing studies.

The administrative policies toward supporting RN student success are a complex web of interacting domains. This study was designed to provide information useful in defining student concerns within the attrition problem in ADN education. Data specific to the changing student population may assist counselors, nursing instructors, and college administrators with respect to RN candidates.

Purpose of the Study

The primary purposes of this study were as follows:

1. Investigate a proposed model for prediction of nursing student academic achievement and retention as related to intellective, environmental impact, and self-efficacy constructs.

2. If, after testing the proposed model, these independent variables are found to predict nursing retention, ascertain whether there are significant differences in academic achievement and retention for traditional versus nontraditional student samples.

The secondary purposes of this study were as follows:

1. Ascertain the extent that select intellective variables (reading and math assessment score, high school GPA [HSGPA], and pre-nursing science GPA) explain

variance in academic achievement and retention for traditional/nontraditional ADN candidates.

2. Ascertain the extent to which student appraisal of select environmental impact variables (academic environmental variables, as defined by Bean and Metzner [1985] and Jeffreys [1998]) further explains variance in academic achievement and retention for traditional/nontraditional ADN candidates.

3. Ascertain the extent to which student appraisal of self-efficacy, designed for first-semester nursing competencies, adds further explanation of variance in academic achievement and retention for traditional/nontraditional ADN candidates.

Importance of the Study

The importance of this study will potentially be to gain insight into what characteristics best predict retention in RN candidates and whether there is a significant difference between traditional and nontraditional students. The success of this potential model can be used to improve advisement and counseling of pre-nursing candidates to increase their chances of successful outcome. The benefit for students entering developmental courses in college study skills as well as remediation support for basic skills in reading, writing, and acculturation may become more empirically clear. Faculty education needs for supportive transcultural tolerance aimed at pedagogically sound practices that improve retention for RN students of difference may also become more evident and have an empirical basis for grant writing.

Self-efficacy, as defined by Bandura (1997), is the ability to believe that one can accomplish goals, overcoming obstacles regardless of the energy expended toward positive outcome. Persistence toward the goal of registered nursing is requisite, and overcoming obstacles can be an effort for even the most supported and talented of candidates (Jeffreys & Smodlaka, 1999). Studies done on a limited population of nursing students where faculty were specifically facilitating candidates toward increased self-efficacy and practicing pedagogically sound supportive attrition practices for nontraditional students have shown improved retention (Jeffreys, 1998; McGinty, 1989; Neville, 1993). These three nursing investigators infer a more comprehensive picture to student RN persistence beyond academic variables alone that include self-efficacy and faculty support systems. The self-efficacy variables and environmental impact variables of nontraditional students in these past studies and the study detailed here, although restricted in scope, are more comprehensive than just the limited dimension of intellective/academic aptitude. It is hoped that the characteristics chosen as predictive variables create a comprehensive characteristic picture, encompassing both the traditional and nontraditional RN student retention.

Investigation of retention may offer proactive implications for administrative policy change in RN programs. The community college vision to meet the educational and health care workforce needs of respective communities is presently not being met and will continue in this shortfall pattern unless nurse educators research and, based on their empirical data, prescribe actions for this attrition problem.

Research Questions

This dissertation was designed to provide answers to the following six primary questions and five secondary questions.

Primary Questions

The primary questions were the following:

1. Is academic achievement of first-semester nursing students related to their student intellective characteristics, appraisal of environmental impact, and perceived self-efficacy score?

2. If a significant prediction relationship is established, what is the best prediction equation for first-semester of RN nursing students' academic achievement and their student intellective characteristics, environmental impact characteristics, and self-efficacy perceptual score?

3. If the above model is found to predict RN student achievement significantly within the combined traditional/nontraditional sample, what is the best prediction equation for traditional first-semester RN students' academic achievement and their student intellective characteristics, environmental impact characteristics, and self-efficacy perceptual score?

4. If the above model is found to predict RN student achievement significantly within the combined traditional/nontraditional sample, what is the best prediction equation for nontraditional first-semester RN students between academic achievement and

their student intellective characteristics, environmental impact characteristics, and self-efficacy perceptual score?

5. Do traditional and nontraditional first-semester nursing student samples differ in academic achievement? If so, how do they differ?

6. Do traditional and nontraditional first-semester nursing students differ in retention? If so, how do they differ?

Secondary Questions

The secondary questions were the following:

1. To what extent, if any, do RN student demographic factors (age, marital status, ethnicity, primary language, country of birth, number of dependent children, socioeconomic status, miles commuted, and number of hours worked in paid employment weekly) relate to first-semester nursing students' academic performance and retention?

2. To what extent, if any, do RN student intellective characteristics of prior science course GPA, HSGPA, reading/English and math assessment test results, and advisement relate to first-semester nursing students' academic performance and retention?

3. To what extent, if any, do RN students' appraisal of environmental impact factors relate to first-semester academic achievement and/or retention?

4. To what extent, if any, do RN students' self-efficacy strength test scores on first-semester nursing competencies relate to first-semester academic achievement and/or retention?

Delimitations of the Study

The following delimitations were established:

1. The student perceptual appraisal instrument in this study was designed to measure correlates of nontraditional college students during the first 2 to 4 weeks of entry to the ADN program.

2. The self-efficacy instruments in this study were adapted as clinical nursing competencies for use only with ADN students in their first semester of program study.

3. The students participating in the study were sufficiently fluent in English to be admitted into an RN program of nursing and therefore could attempt to understand the instruments used to collect data in this study.

4. The teachers participating in the study were delimited to instructors certified by their respective BRN and therefore were capable to make evaluative outcome judgments of RN student academic achievement and program retention.

5. Students' reasons for attrition from the program (e.g., illness, family needs, clinical failure, academic failure, or personal dislike of the service-related profession of nursing) were sought from nursing instructors and coded, respectively.

6. The clinical environments that these freshman students encountered to perform their course objectives were not the same for all schools investigated in this study.

However, the beginning RN student is placed in early clinical course work to ascertain and improve proficiency on basic nursing skills that can be considered similar across multiple levels of acuity in health care facilities.

Conceptual Assumptions

The following conceptual assumptions were implicit in this study:

1. The theoretical construct of self-efficacy can be ascertained by the student appraisal of self and measured over specific educational course competencies (Bandura, 1997; Pajares, 1992; Zimmerman, 1990).

2. A conceptual model of nontraditional undergraduate student attrition examining the students' appraisal of environmental impact factors can be operationalized in a tool measuring how supportive or restrictive their background defining factors, academic factors, and environmental factors influence their higher education persistence and outcomes (Bean & Metzner, 1985).

3. A viable operational distinction exists between academic achievement in the form of numerical grade, nursing program retention, and rationale for unsuccessful outcome in first-semester nursing course (Jeffreys, 1998).

4. RN student preparation is a complex aggregate of community college policies, clinical affiliation demands, legislative directives from the BRN, and health care provider competencies that the student and instructor are obliged to maintain in order to meet consumer protection (BRN, 2000).

CHAPTER 2

REVIEW OF THE LITERATURE

This literature review serves as a framework for the design of this dissertation research. The literature review is divided into three main categories: (a) retention theory and its historical antecedents; (b) self-efficacy theory applicative to education, motivation, and student outcomes; and (c) best practices toward student retention in higher education. Specific retention research highlighting the needs of nursing students brings to a close all three sections of this literature review. The transcultural concerns of students of difference are a continuous thread throughout the literature review.

Higher Education Retention Theory

Nontraditional college student retention, according to Tinto (1993), was derived from the 1960s persistence models of Sumerskill and Marks with regard to student intellectual attributes. Tinto (1993) described the history of traditional and nontraditional retention models, citing Heilman, Rossman and Kirk, and Waterman as authors who annotated roles, personality, and motivation/disposition concepts during the 1960s. Bean and Metzner (1985) differentiated traditional and nontraditional students of higher education. Categorization of a student as nontraditional in higher education is brought about by displaying one or more of the following characteristics: (a) older than 24 years, (b) nonresident status (commuter), (c) off-campus job greater than 20 hours per week, or (d) immersion in family and community responsibilities (Bean & Metzner).

The first objective of this section of the review of literature is to display the evolution of nontraditional models of retention from a brief historical review of persistence theory. The second objective is to highlight models used to research the nontraditional student within the community college and nursing major. The retention and persistence models of Astin, Pascarella and Terenzini, Voorhees, Nora, Cabrera, Rendon, and Bean/Metzner, among others, are included. A scan of the higher education research literature, utilizing these retention models for traditional/nontraditional college students and specifically nursing candidate retention, exhibits the complex issue of persistence.

Chronicle of Retention Research

This chronicle of retention research is presented in three sections. First, historical antecedents of student retention theory are summarized. Second, this historical development is focused on the community college and nontraditional student retention. Third, retention research is projected into the next millennium.

Historical Antecedents of Student Retention Theory

Baird (1996) outlined a brief historical review of "impact" retention models, within the text of Komives and Woodard entitled *Student Services*. His critique of the rival conceptual frameworks on early retention theories stated a lack of comprehensive theory, noting inconclusive study of students' stable intellective and non-intellective traits. The college student was measured against a static college monolith. The early theories credited to Astin (1975. 1996). Tinto (1993. 1998). and Pascarella and Terenzini (1991) were described by Baird as singularly student focused. requiring student adaptation to college and yielding questionable persistence and retention results (Baird. 1988). The student was displayed as in need of interacting and integrating into college. with persistence seen after student assimilation. Baird noted a difference in the 1980s and early 1990s with an evolution of theory toward a holistic view of the collegiate experience. These early authors (Astin. Tinto. and Terenzini and Pascarella) expanded their models to incorporate the faculty effect. student goals. college institutional/environmental impact. and non-intellective student entry characteristics (Astin. 1996: Tinto. 1993: Pascarelli & Terenzini. 1991).

The unique authorship of theory development inclusive of all stakeholders of the college system is hard to credit and isolate to one singular famous theorist. Baird (1996) described overlap and collaborative influence when tracing multiple researchers through their emergent theory development. Mow and Nettles (1996) also traced a 40-year timeline of historical retention research. Mow and Nettles categorized retention research in statistical research terms. defining the 1960s/1970s as descriptive/comparative. the 1980s as inferential. and the 1990s as comprehensive structural equation modeling and path analysis approach. The chronological tracing of retention theory timelines. as laid out by Baird. Tinto (1993). and Mow and Nettles. showed joint construct development and joint authorship of research between all of the early traditional and nontraditional student retention theorists. To this end. this paper does not credit any one comprehensive theory to one author but, instead, associates certain keywords to noted researchers in persistence study.

The student viewed as a "consumer" created an improved status and fair play for students by implying a shared accountability for persistence with a more dynamic college. Baird (1996), in his own retention constructs, reproduced this level playing field among the stakeholders in the college environment by researching climate through student-faculty relationship, policy flexibility, academic rigor, institutional culture, and inclusiveness. Pace (1993) produced a more refined tool labeled the College Student Experience Questionnaire (CSEQ) and moved the field of retention and college outcome study with this tool from the solitary student-focused theories into a comprehensive "consumer opinion" model. The mid-1990s showed all collegiate stakeholders as generating a quotient of persistence prediction within a comprehensive learning community, recognizing both traditional and nontraditional student groups (Baird).

Community College and Nontraditional Student Retention Focus

Voorhees (1987) championed a nontraditional persistence model, identifying student demographic constructs, particularly in the community college. Voorhees was among the first to examine the definitive student attending community college through variables of common characteristics. The discriminant analysis research of Voorhees built models of community college persistence while holding constant the demographic characteristics of gender, intent to return, transfer rate, and nontraditional student traits.

Bean (1980) developed the Model of Undergraduate Student Departure from higher education. Bean and Metzner (1985) built upon this paradigm by borrowing from employee persistence and retention constructs within industry. Bean and Metzner advanced a causal model of Nontraditional Undergraduate Student Attrition, exploring the unique characteristics of the older student with outside community responsibility. The nontraditional student constructs of environmental, academic, and background-defining variables designated a rational model for community college researchers to use in prediction research. Academic variables included the students' perceptions of how supportive or restrictive their study hours, study skills, academic advising, and absenteeism would be toward their projected educational goals. Background and defining variables were age, number of hours enrolled, high school performance, ethnicity, and gender. Environmental variables were student's report of finances, hours of employment, outside encouragement, and family responsibilities.

Bean and Metzner (1985) posited that nontraditional student persistence was not caused as much by the prior theories of integration and social climate. Instead, these authors believed that academic persistence behavior was heavily impacted by the student's awareness of personal goals and a weighting of this goal versus enhancing or restricting factors within the student's own characteristics of academic, environmental, and background-defining factors.

A large urban commuter college researched by Cabrera, Castaneda, Nora, and Hengstler (1992) used the unique approach of two theories, converging Tinto's Student Integration Model (1982) and Bean's Model of Student Departure (1980). Bean's model addressed the outside community forces that can interfere with student time and attention to study tasks. The utilization of both of these theories explained more variance in student persistence and more accurately displayed the "external community impact forces" of nontraditional students.

Aschar and Skenes (1993) challenged Tinto's (1982) Student Integration Model, claiming that it did not characterize completely a holistic picture of student departure for either the nontraditional community college or the 4-year traditional student. Asher and Skenes broadened the critique of Tinto's constructs, explaining that the student focus on campus participation fails to explain the outside social community forces that may impact the decision of a community college student to depart.

Nora, Kraemer, and Itzen (1998) studied persistence among nontraditional Hispanic college students, using a causal model design. The 324 community college students were reviewed for environmental and institutional factors through structural equation modeling. Results showed a valid model arranging social experiences, academic difficulty, and attitudes toward family as a broader representation of external community forces impacting Hispanic student persistence.

The minority student undergoes a unique cultural and financial experience, while exhibiting poor outcomes in the higher education system, according to Nora et al. (1998). The research of Voorhees (1985), Herndon (1981), and Olivas (1996) explored financial aid consequences to Hispanic, Native American, and Black students, and found that use of monetary assistance showed evidence of a significant correlation to persistence. Astin (1993) reported research on student retention focusing on student involvement. Astin found that negative correlates of retention were working greater than 24 per week, working off campus, and commuting. Feldman (1993), in his community college retention study, highlighted pre-enrollment intellective variables, demonstrating that the lower the entering GPA from high school, the more likely the student is to drop out.

Terenzini (1987) redefined retention/attrition outcomes by operationalizing persistence constructs with the wording: persister, stop out, dropout, and attainer. Mohammadi (1996) used Terenzini's definitions for student persistence in a 4-year longitudinal study of the Virginia Community College system. Mohammadi's overall findings gave evidence of student goals having the greatest impact on persistence outcome in the community college. Pascarella and Terenzini (1991) and Davis and Murrell (1993) added to the Astin and Tinto models and increased construct development on institutional characteristics, student peer interactions, student responsibility, and student effort.

Davis and Murrell (1993) expanded upon institutional responsibility with a faculty and college system that enabled student success in a holistic learning community. Student-faculty interaction, peer relationships, student goals, and campus climate were the constructs blended by Davis and Murrell, utilizing Pace's CSEQ. The CSEQ allows researchers to collect data about student satisfaction with a more holistic accountability for the entire college learning community (Baird, 1996).

Retention Research in the Next Millennium

Attinasi and Nora (1992) advised use of multiple statistical methods, including structural equation modeling, to study the convergence and divergence of persistence theories, constructs, and student characteristics predicting retention success. Stage (1996) wrote that, in the new millennium, researchers would be utilizing "borrowed" interdisciplinary theory to build persistence models. Stage used engagement constructs, originating in industry disciplines, which strongly supported similarity of human behavior seen in retention for jobs and college persistence.

Duran (1996) noted that all college stakeholders are best studied in qualitative and naturalistic research, including in-depth exploration of racial minority students. Duran noted that qualitative research format might uncover issues not present in quantitative tools, improving the broadness of scope for scholarly investigation. Stage (1996) presented the case for flexible research methods which would distinguish research instruments from earlier quantitative measures. Stage posited that these quantitative tools were possibly narrow in perspective, predictive ability and, therefore, prescriptive scope.

Baird (1996) stated that all players in the new millennium are held to an institutional accountability while facing a more dynamic university with a "Flexible Walls and Cyber-Outreach" instead of a static monolith with rigid "Ivory Tower" and walls. In addition, the emphasis in the last decade has included many minority learner concerns. Tierney (1992) interpreted Native American student persistence issues as committing cultural suicide due to forced assimilation in rigid college cultures. Tierney challenged the institution to adapt and show tolerance for racial pluralism and be accountable to minority attrition. Moore (1990) directed that quantitative tools and qualitative questions be constructed (with respect for minority learners) as a participant consumer needing clarity in goals, involved teaching, and transformational college management.

Present retention models have expanded toward minority concerns with further recognition of nontraditional student characteristics reflecting the transcultural impact of community immersion to retention (Rendon, 1996). Intellective and non-intellective student characteristics are now included in development of comprehensive persistence models. Toward addressing the literature of nontraditional and minority health care providers, the third area of retention theory focuses on the status of nursing persistence research and the changing demographic of RN students.

Nursing Education Applied Retention Research

Student nursing retention research seen in the literature began, much like early persistence study in education, as exploratory and descriptive, while lacking theoretical coherence. Descriptions and correlations studies of persistence with select intellectual or non-intellectual learner characteristics continued to reflect conflict among study results, with weak correlation and low percentage explanations of variance (Jeffreys, 1998). Literature exploration of nursing research and retention models is organized into subcategories of intellective markers of GPA, environmental impact, non-intellective characteristics, qualitative RN research, nursing leadership in higher education.

pretesting, and remediation, faculty impact, and immigrant RN students. The following four retention studies exemplify how the field of nursing scholars continues to seek answers of prediction of student persistence.

Intellective, Non-intellective, Environmental Impact Student Characteristics

Multiple nursing student retention research endeavors are listed here, reflecting easily challenged, inconclusive study. The first three studies explored here were completed with conceptual frameworks over limited variables, a weak correlation for prediction, and no model development. Vincent (1992) studied the GPA of a Baccalaureate in Science in Nursing (BSN) population of 128 students before entry into the nursing major and academic achievement outcomes in early nursing courses. Vincent found significant correlation and prediction of success in the nursing major. Schreibner (1995) researched predictive characteristics for pre-nursing majors and found that prior GPA accounted for less than 30% of variance in the successful completion group. Her study also included cognitive appraisal attributes to round out the persistence picture. Tolland (1990) studied nursing students (women only) for non-intellective characteristics of self-esteem and fear of success, utilizing the Strong and Campbell Interest Inventory (SCII). Her results from the SCII were found to be a valuable predictive tool in significantly correlating retention and successful outcome for women seeking the RN major. Shock factor (the difficulties of RN study) and academic rigor became the major themes from qualitative interviews following quantitative data collection. Tolland's themes from interviews were noted as potential changes for student services practices.

Tolland's research has been incorporated into many pre-nursing course syllabi with discussion of realities, goal prioritization, and values clarification content. Tolland suggested that further study may be helpful to assist women in the decision-making process before RN studies.

Lopez (1992) studied retention of students in the California State University nursing programs. Her quantitative questionnaires isolated such factors as nursing grades, family/academia support, and prior science (chemistry and biology) course grades; these variables were studied by discriminate function analysis. Results indicated that nursing grades and family support were the significant determining factors between dropouts and successful graduates of the nursing program.

The actual applied responsibilities of the RN require both highly analytical/intellective and caring skills, thereby utilizing some degree of non-intellective characteristic. Baird (1996) wrote of this competitive debate, pointing out the fallacy of which characteristic best predicts student persistence. Concisely, Baird's point was that arguing about singular or best characteristic distracts from and fails to address the complex nature of retention in higher education research. Likewise, in nursing retention research, examining a few intellective or non-intellective student characteristics fails to form comprehensive models or theories with reliable prediction about student nursing retention.

Model development and application of existing theory strengthened the next two studies. Byrd, Garza, and Nieswiadomy (1999), in a 3-year ex post facto study of BSN successful completion, presented models that GPA might not be the sole reason for attrition. This team looked at demographic variables, pre-nursing GPA, National League of Nursing (NLN) scores, and number of transfer hours. Their study of 285 RN students reflected that 8% (22) failed and 21.2% (59) dropped out. Byrd et al. developed three prediction models, and the discriminant analysis showed pre-nursing GPA to be the most reliable indicator of attrition prediction. Ethnicity was unevenly distributed in the study because 82.5% of the students were Caucasian; therefore, this study cannot be generalized to populations that are more diverse.

Prediction and Remediation

The concept of paucity of college level skills, remediation, and persistence has been documented by Tinto in his text *Leaving College: Rethinking the Causes and Cures of Student Attrition* (1993). Glanville (1989) believed that it would take more than remediation to impact persistence. Glanville studied longitudinally for 1 year a cohort-type involvement program that remediated pre-nursing majors in mathematics. The students were assigned either to a special involvement remediation cohort or to a remediation class before RN program admission. The concept of cohort-type support applied to students' specific nursing mathematics examples and RN student-peer advising. Glanville hypothesized that gaining a sense of group belonging was not significant for RN program retention. The null hypothesis was rejected with significant results of 79% (41 of 52) of the cohort group retained and 59% (25 of 44) of the non-cohort group retained.

Lettus (1990) studied the relationship of learning, motivation, and social supports from a nontraditional assessment program in Baccalaureate nursing. Boshier's Model of Educational Preparation and Dropouts was the conceptual framework for the variables of learning style, social supports, and demographics. Discriminant analysis reflected personal support, academic support, and interpersonal orientation as significant predictors of persistence in the final model. Lettus indicated that identification of the intellectual or non-intellectual characteristic best predicts success remains open for further empirical study. As with the work of educational theorists, student retention models in nursing incorporating all higher education players are not present in the literature. According to Lettus, the construction of empirical retention models with structural analysis still requires refinement toward reliable prediction of nursing student attrition.

Jeffreys (1998) conducted descriptive research on associate nursing degree candidates, utilizing a convergence of the Bean and Metzner model of Nontraditional Student Attrition and Bandura's construct of self-efficacy. The research tools were specifically designed to gain student perception over Bean and Metzner's academic, environmental, and background-defining constructs. Jeffreys clarified the early nursing curriculum goals of first-semester students as the eight vectors of freshman nursing. Jeffreys requested the students to evaluate their self-efficacy over these nursing vectors, itemized as specific behavioral clinical competencies. The use of a conceptual framework with converging theories, by Bean and Metzner and Bandura, showed scholarly strength in predicting retention and additional explanation of variance. A final predictive model for future application was not outlined by Jeffreys due to a final sample with few diverse students. To this point, the discriminant analysis research conducted in this study aimed to gain further description and enlightenment regarding nursing retention model development.

Qualitative Research of Nursing Retention

The field of nursing is changing to include more men, minority, and students of nontraditional student definition. According to Stage (1996), qualitative study advances a broader range of concerns for theory formation and quantitative tool construction. Community college Puerto Rican and Black RN graduates were studied by Jones (1992) and Janes (1993), using qualitative methods. Students were asked questions about their successful BSN completion. Tinto and Astin models were used to develop questions concerned with student integration, academic integration, financial aid, and student involvement. These authors assimilated data through the lenses of Tinto's student retention tenants and Astin's student involvement constructs. Outside of financial concerns, both researchers found that the student responses were supportive of integration and involvement theories.

Benda (1991) also studied Baccalaureate nursing students using Tinto's Model of Student Integration. The traditional student profile matched the demographic description of Benda's BSN nursing students. The match of Tinto's model to those traditional students in the research by Jones (1992), Janes (1993), and Benda is consistent with students adapting to the college institution. ADN students do not classically match the traditional student profile and thus are not well suited to the Tinto's Model of Student Integration.

Henry (1995) studied, through qualitative inquiry, students' self-perceptions of support systems related to factors of persistence in ADN programs. The student responses were not clearly matched to the questions but instead defined the factors that impede program progress in four categories: (a) academic factors (coping with the amount of course work); (b) personal factors (lack of self-confidence, low self-esteem, perseverance); (c) situational factors (fright, transition/re-entry concerns, adult issues of demand, faculty compassion concerning personal disturbances to patterns of study); and (d) institutional factors (curriculum, counseling/support services for the student). Henry redirected RN student interviewees toward supportive coping and resources. The student perceptions of supportive factors included self-determination, perseverance, compassion and interest by faculty, peers, study groups, and financial aid.

Ballmer (1999) did Van Kaam's psychophenomenological method of study with a purposive sample of 8 minority graduates of nursing. The essential elements that Ballmer recorded were predominantly affective domain noting student perceptions as feelings and comments. Themes that developed from students' responses were not being isolated, dissimilar faculty treatment, and believing in one's self.

Neville (1993), in qualitative written comments, surveyed predictors of success from 115 randomly sampled nursing programs. The directors answered the qualitative written questions about students who failed the program and students who passed the program and NCLEX-RN. Three major reasons for attrition occurred as themes:

(a) family responsibilities and the demands of juggling school and home, (b) failure in nursing courses, and (c) inadequate finances. Questions answered by directors about what was needed for student persistence reflected themes of caring faculty, peer study groups, and concerned advising. Completion of all non-nursing courses as well time and stress management were additional themes.

Rubino (1998) researched samples of ADN students, using a pre-admission test that is known for its cultural broadness. The Nurse Entrance Test (NET) measures basic aptitudes of reading, writing, arithmetic, and stress indices. The NET overall subscore had the greatest correlation to predicting program GPA. The NET reading composite score had the highest correlation with program completion and NCLEX-RN passing. Math correlated significantly with first- and second-year persistence. Stress scales showed that the higher the stress score, the more likely the student was to fail to persist to RN program completion. Crow (1997) and Tierney (1996) suggested that reading and math admit scores act as elimination criteria that restrict diverse students from higher education. The text *Current Issues in Nursing* by McCloskey and Grace (1994) explored the validity of intellect as a singular measure and its relevance as an admission criterion. McCloskey and Grace found that intellective measures alone had poor reliability as predictors of outcome. The work of McCloskey and Grace refuted the culturally less-sensitive NLN Pre-RN Exam.

Stevens (1996) studied program attributes by exploring faculty composition correlates to RN student attrition and persistence and the pass rate on the NCLEX-RN. Faculty response reflected that nontraditional students require more time, individualized tolerant curriculum, and flexible policy for re-admission. The most significant positive correlation findings were that the lower the "full-time faculty to student ratio," the more students were retained and the greater the numbers for first-time NCLEX-RN pass rate. In addition, Stevens found that, as faculty-student ratios increased, less time was available for the faculty to spend with the nontraditional student. Nontraditional student attrition occurred sooner, with an overall decreased time in the program and persistence rates.

Rew (1996) affirmed the need for cultural diversity training for nursing faculty in a pathways model aimed toward student retention. The detail of this model acknowledged student diversity through educational preparation, awareness of cultural complexity in learners, and socialization of students' experience. Faculty education and mentorship were advised by Rew to retain diverse nursing students of disadvantaged backgrounds.

Ehrenfeld, Rotenburg, Sharon, and Bergman (1997) wrote of the reasons for student attrition in nursing courses in the international arena. Tel Aviv, Israel had experienced a 3-year high immigration rate. Similar immigration rates are reflected in the southern and western United States. HSGPA was found to be the most frequent admission criterion and implied predictor of success. Ehrenfeld's work reflected an incongruence of HSGPA and prior grades as significantly predictive for the immigrant RN student. The most salient predictive finding in her immigrant sample displayed minority males at a higher-than-average attrition/dropout rate. The reasons for nonpersistence were GPA and department withdrawals for inappropriate behavior.

In summarizing the review of retention theory, the use of a more comprehensive model for student retention has been implied from empirical evidence. The best predictive variables for the nursing major from the empirical evidence presented in this literature review are yet inclusive, with poorly organized compilation of intellective, environmental impact, and non-intellective student characteristics. Comprehensive study that embraces traditional and nontraditional retention models related to industry, psychology, and education have shown evidence of a heightened awareness of multifaceted factors enhancing persistence.

Self-Efficacy Application to Higher Education Student Retention

The definition of self-efficacy, by Bandura (1997), is the ability to set a goal and believe that one can accomplish that goal, regardless of the effort and energy needed to attain it. The theory of self-efficacy is mainly credited to Bandura; however, hundreds of researchers in psychology, health care, sociology, and education have presented empirical evidence of self-efficacy as a framework for motivational and persistence hypotheses of human behavior. The definition of self-efficacy is addressed by gaining insight into the ontological view of cognitivism, the nature of self-agency, the psychodynamic sources of self-efficacy, and intervening processes with self-efficant behavior. The major theories of self-efficacy are organized in categories of use: psychology, health functioning, and educational applications of global versus specific efficacy. The higher education use of the concept of self-efficacy is detailed in relation to stakeholders of education, namely students, teachers, and schools. A report of collected nursing education research is used to display observed evidence utilizing self-efficacy in education and RN preparation.

Self-Efficacy Theory

This section is organized into three subjects: (a) defining pertinent terms, (b) the psychodynamics of self-efficacy, and (c) health enhancement and self-efficacy.

Defining Self-efficacy, Cognitivism, and Self-Agency

The origin of self-efficacy theory is credited to Albert Bandura (1997). His empirical research work reigns over four decades and hundreds of applied human behavior studies. The ontological origin of self-efficacy theory began within cognitivism, and psychologists acknowledged self-efficacy constructs as social cognitive theory (Bandura, 1997). The tenets of this branch of cognitivism are that occurrences/experiences of a person are not random, spiritually predestined, and uncontrolled. Self-efficacy is based upon the internally held belief that one has some ownership of experience, can set goals, can control behavior to reach outcomes, can choose to react to confronting obstacles, and can continue to believe in the ability to reach a goal. These tenets were labeled as "self-agency" by Bandura (1991b). He viewed self-agency as initially coming from a cognitive process, detailed as ability to predict/forecast desired outcomes. A self-efficant individual, according to Bandura (1997), holds beliefs for desired outcomes, shapes planning for action, and revises plans toward accomplishing goals with a positive eye to preferred results in his life. Self-efficacy also connotes that human beings can and do organize the supports necessary to accomplish goals.

Cognitivism and self-efficant thought process, according to Sperry (1993), are outlined as not reductionism or dualistic thought process. Cognitive social theory for both Bandura (1997) and Sperry holds the belief about the human brain that a pluralistic ability to operate interactively on many levels of motivational constructs eventually determines belief in self and courses of action. Human self-agency has been put forward as an acquired skill which displays the action of internalized self-efficacy. Self-agency embodies foresight, proficiency, and means to influence a course of action toward the preferred goal. According to Bandura (1991b), self-agency moves the individual to construct environments to suit personal purpose and connect a chain of causation from self-belief to action and on to goals. Bandura (1995) offered that self-efficacy should be seen in the context of dependence and causation between events. The interaction of the constructs of personality, motivation, and expectancy-value was acknowledged by both Sperry (1993) and Bandura (1997) as working together but not the exact same.

Bandura (1997) noted that self-efficacy could be erroneously viewed as identical to other constructs of personality and motivation such as self-concept, self-esteem, determinism, and personal self-regulation and control. Bandura noted that the expectancy-value constructs of personality and motivation are interactive within the brain and impart some influence in self-efficacy learning. Rotter's Theory of Locus of Control (1966) bears the greatest similarity to self-efficacy theory. Bandura (1997) showed empirical evidence that locus of control is often not a good predictor of behavior.

Bandura defined locus of control as limited to beliefs about actions that affect outcomes, while self-efficacy was perceived belief that one can produce certain actions. Smith, Arnkoff, and Wright (1990) corroborated this difference in their findings while exploring locus of control and self-efficacy in academic competence and test anxiety. The subtle differentiation of related constructs of personality and motivation have been the empirical life work of Bandura and his colleagues, showing social cognitive thought in terms of efficacy, judgment, and action constructs (Bandura, 1997).

Psychodynamics of Self-Efficacy

The psychodynamic process of self-efficacy development interacts with a realistic knowledge of self through authentic self-monitoring, self-appraisal, and self-regulation (Bandura, 1991a). Bandura (1997) wrote that the sources of self-efficacy belief are composed of four principal areas of information about oneself: (a) enactive mastery experience, (b) vicarious experience, (c) verbal persuasion, and (d) physiological and affective states. Enactive mastery is the most powerful verification within an individual: one can believe in self-abilities and focus abilities toward accomplishment. The concept of accurately knowing that one will have to expend energy, persevere, risk failure, and perhaps begin again is learned through enactive mastery experience (Bandura, 1997).

A key concept of self-efficacy development, according to Zimmerman and Ringle (1981), is remaining levelheaded to the effort, self-regulation, and persistence required for successful outcome. Bandura (1997) made a very important application for educators to help learners to be grounded in realism (not overly confident or overly doubtful) to the effort that they themselves will have to expend toward a desired learning goal. The research by Jeffreys (1998) exemplified this pitfall of an "over-exaggerated sense of self-efficacy" in her research of nursing students. The "supremely self-efficacious RN student" who did not believe that he/she had to expend much time in preparation for academic/clinical endeavors often failed at an early point in the program competencies and quickly left the associate degree program. The RN students researched by Jeffreys matched the warning of Bandura (1997) and research by Zimmerman and Ringle. These four authors agreed that educational application of self-efficacy through pragmatic uncertainty in new tasks engages the student in more preparation effort, reasonable expectancy at level of difficulty, and belief in perseverance in the face of possible failure (Bandura, 1997).

The vicarious modeling experience of an individual is an instructional process that exemplifies how to act and predict what other skills are required, as well as a sense of control over the anxiety of starting endeavors and failing (Bandura, 1996). Verbal persuasion adds to self-efficacy when significant others voice realistic confidence in the abilities of the individual. Bandura (1997) wrote that verbal persuasion has a limited effect on sustaining self-efficacy. Real-life mastery experience must match credible appraisals by others to create a strong sense of lasting self-efficacy. The mood of the individual is also related to self-efficacy and is reflected in research of patient teaching and compliance to cardiovascular rehabilitation. The self-efficacy scoring tools of cardiovascular patients correlated in significant path analyses. These results indicated that sad times produced a lowered efficacy score, bringing about little patient engagement, while happy times correlated to raised scores, with perseverance toward restorative health practices (Jenson, Banwart, Venhaus, & Popkess-Vawter, 1993).

The definition of self-efficacy is limited to a *belief* about ability, not the actual measured aptitude or actions toward a goal. Bandura (1997) theorized that the integrated self-efficant individual eventually associates sources of efficant experience. The connection of self-efficacy beliefs, created from legitimate experience sources, can help to connect beliefs in self-agency to causation. These self-efficacy beliefs can impact effort, persistence, and coping behaviors, thereby enhancing persistence. The theoretical use of self-efficacy is displayed next within the fields of health enhancement and education, with empirical documentation.

Health Enhancement and Self-Efficacy

The epistemological use of self-efficacy theory has been theorized by Bandura (1997) for patients with health education aimed at prevention and chronic disease management, including cardiovascular, arthritic, and mental health diseases. The effort required to change life style behaviors for one's own health or survival requires a strong cognitive belief system that considers a continuous flow from self to disease in causation linkage. The ownership of desired health outcomes clearly connected to behavioral change is necessary for motivation to be sustained in individual behavioral changes needed for health. Bandura (1997), among others, developed psychological determinants of health behavior. The social cognitive model credited to Bandura has the most inclusive conceptual model with overlap of tenets. The model contains the following constructs: (a) self-efficacy, (b) outcome determinants (physical, social, self-evaluative), (c) goals (proximal and distal), and (d) impediments (personal/situational and health system).

Knowledge, according to Bandura (1997), creates the precondition necessary for change. His model of health behavior subsumes this knowledge tenet; however, initial choice of change behavior, continuity of change behavior, and self-regulatory actions require more than knowledge alone. Bandura developed his self-efficacy model to predict persistence, success, and failure of healthy life style modification.

The research of Maibach, Flors, and Nass (1991) showed the impact of pre-existing and recently acquired knowledge-based self-efficacy after a health education campaign. The pre-existing measures of health self-efficacy had less predictive effect on health change behaviors than recent health care campaigns. These two types of self-efficacy together (pre- and post-educational intervention) gave a high measure of prediction of behavioral change. The applied educational implications, according to Luepker, Murray, Jacobs, Mittlemark, and Bracht (1994), are to continue to saturate the public with accurate health enhancement knowledge and the implications of personal self-efficant and self-regulatory behavior. The analogy to connect health behavioral change to many types of adult educational processes is evident in the following educational applications.

The use of social cognitive theory has been most evident in empirical educational work with children (Bandura, 1997). The tenet of self-efficacy is depicted within the cognitive, meta-cognitive, and self-regulatory/motivation, for both pedagogy and androgogy. Vygotsky's principal of beneficial self-speech was noted by Bandura (1997) as early-origin cognitive process theory that influenced development of self-efficacy theory. The evolution of self-agency constructs can also be traced to Vygotskian self-tutoring, making clear the interconnection of self-efficacy to educational theory. Bandura (1997) credited guided mastery, teacher feedback, and self-affirming educational constructs to the expansion of self-efficacy theory. Bandura (1991a), Zimmerman (1989, 1990), Schunk and Rice (1993), Jourden (1991), and Grow (1991), among others, advised that predictive models of education research make use of self-efficacy theory. Zimmerman (1990) avoided vague research tools and operationalized self-efficacy theory through development of definitive educational competencies. Zimmerman, Bandura, and Martinez-Pons (1992) found improved outcome prediction for adult learners by including student intellective characteristics and self-reported perceptions of efficacy over definitive educational competencies.

Education and Self-Efficacy

The educational use of self-efficacy theory, according to Bandura (1993, 1997), Pajares and Miller (1994a, 1994b), and Zimmerman (1989, 1990), yields inconclusive results when questions are global impressions of self-belief. These authors wrote that self-efficacy theory research applied to education must be operationalized with instruments labeling specific educational outcomes. The examples of Pajares and Miller (1994b) displayed self-efficacy in mathematics. Their work, showing path analysis models of mathematics as a global broad subject of ability, gave weak evidence of prediction. Revised self-efficacy tools by Pajares and Miller (1994a) delineated specific competencies in elementary math, algebra, trigonometry, or calculus mathematical functions, and incrementally increased prediction toward mathematical course outcomes (Bandura, 1997).

The empirical evidence of Zimmerman (1989, 1990) has been the foremost exemplar of academic application of self-efficacy through models, particularly in the area of self-regulation and goal achievement. The social cognitive theory that forms a framework for Zimmerman's educational outcome prediction model included self-efficacy determinants, intellective characteristics, affect, and development of self-regulatory skills. Schunk (1995) added that the instructional environment, specifically teaching style, acts directly on intellectual outcome and that teacher development of student self-efficacy can, in part, mediate improved outcome.

In synopsis, self-efficacy theory applied to education models mimicked the self-talk and guided mastery principles of Vygotsky. Bandura (1997) wrote of the analogy of Vygotsky's work and educational tenets as influential in his theory development. The sources of self-efficacy, as stated by Bandura (1997), are mastery experience, vicarious experience, and verbal persuasion. These self-efficacy tenets run parallel to educational practices of active learning, teacher modeling of desired learner outcomes, and teacher/parent/ significant other feedback in the learning process. The self-reported perception of efficacy by a student is a better measurement than teachers' evaluative judgments of a student's efficacy (Bandura, 1997). The tools of self-efficacy are best operationalized in self-report questionnaires of specific learning competencies, not in global subject references (Bandura, 1997). Self-regulation is a set of skills that can be taught in the educational setting (Zimmerman, 1990). Self-efficacy is a fluid trait and can be changed through teaching/learning techniques (Schunk, 1995). Self-efficacy can be improved incrementally with successful mastery/vicarious/verbal persuasion experiences (Bandura, 1997). The inclusion of intellective characteristics in predictive self-efficacy models improved empirical prediction of successful student outcome (Zimmerman, 1989, 1990).

Self-Efficacy and Higher Education Retention Research

Bandura's main constructs of self-efficacy in education have been tested by Warkentin (1994), proposing a theoretical model comparing the relationship of college student study activities, prior content knowledge, self-efficacy, and classroom achievement. The results showed that self-efficacy, when consistent to student prior content knowledge, became the strongest predictor of classroom achievement. According to Bandura (1996), "highly efficacious" students attributed their academic failures and setbacks to their own insufficient effort while studying and redoubled their efforts toward the goal. "Lower self-efficacious" students were distracted by negative thinking, dwelling on failure with self-doubts, and their ability to concentrate was disrupted, affecting persistence. Bandura (1997) indicated that the "supremely efficacious" person may underestimate the study time and effort required to reach a goal and that their resultant failure can be overwhelming to self-esteem, causing avoidance behaviors.

Cabrera et al. (1992) developed an Integrated Model of Student Persistence and Career Making Decisions, emphasizing self-efficacy and financial perceptions of students. The 22 variables were combined toward study of community college student persistence. Their findings reflected that self-efficacy expectations of adult persistence had a significant impact on retention. The work of Cabrera et al. showed how complex the nontraditional community college student is to predict for persistence and retention. Sandler (1998) used part of Cabrera et al.'s model while sampling 973 nontraditional college students. Sandler meshed the Career Decision-Making Model of Self-Efficacy (CDMSE) and an integrated model of student persistence. The combined models had 11 exogenous variables that statistically controlled for adult learner characteristics. The 11 endogenous variables were measured within a nonrecursive structural equation. Six of the endogenous variables had significant predictive findings. The four subscales of the CDMSE (academic integration, cumulative GPA, goal commitment, and institutional commitment) reflected that self-efficacy beliefs were most significantly correlated to predict actual student persistence.

Dugan (1999) investigated academic, cognitive, personality, and institutional predictors of outcomes of retention and academic performance for community college students enrolled in general education courses. Multiple regressions to assess validity of student self-rating, reading ability, and introversion/extroversion temperament scores were used to predict the community college student retention. Dugan's statistical results noted the difficulty in predicting student retention with strict precision. Dugan proposed self-efficacy training for students with test/retest experimental design as suggestions for further research.

An experimental study of community college students by Marrello (1999) sought to predict persistence through social integration constructs that promoted student self-efficacy and motivation. A sample of poorly prepared students was assigned to reading and writing instruction done in an integrated program design resembling a cohort. The treatment group received identical class schedules, counseling, and encouragement to develop peer student relationships. The control group also received reading and writing classes but without the cohort effect. Marrello's experimental design also included pre/post tests on reading, writing, and motivational scales, including two subscales of self-efficacy. The treatment cohort sample of 46 students was compared to a nontreatment sample of 42 students by measuring community college success. Self-efficacy scales of test anxiety and belief in self for learning ability were statistically significant for the integrated/cohort group. Comparisons of integrated versus nonintegrated outcomes of college level course completion were statistically significant for the integrated/cohort group.

Nursing Student Self-Efficacy and Program Retention

The use of self-efficacy theory research in the preparation of nursing students, specifically aimed at exploration of student problems with retention, occurred in nine empirical studies reported in the literature. Rosen (1999) explored use of self-efficacy in community health competencies for 461 senior nursing students in ADN/BSN programs. The results supported Bandura's postulate that practice/experience is the most important factor in building perceived self-efficacy. Enactive mastery experience plus vicarious experience explained 15% of the variance in student outcome in community health nursing competencies.

Harvey and McMurray (1994) considered self-efficacy as a means of identifying problems in nursing education and career progress. Academic and clinical self-efficacy scales were developed specific to nursing course competencies. Student perceptional scores over academic self-efficacy yielded lower scores as a significant prediction of withdrawal.

Eaton (1992) studied retention using an experimental research design for the effect of self-efficacy training with ADN student nurses in the clinical domain. The author cautioned the reader about generalizability of this study due to violations of internal and external validity, specifically including total sample size of 36 subjects, nonrandom selection, and internal and external validity due to the natural clinical setting impacted the interpretation of this study cautiously. The treatment group was exposed to self-efficacy-raising techniques (feedback/verbal persuasion, modeling/vicarious experience, and interactive clinical practice/enactive mastery). Results with this small sample of 12 students in the self-efficacy treatment were that 100% retained, compared to 88% and 85% retention, respectively, for two nontreatment groups (12 students each). The study seems best interpreted in the self-efficacy pretest and posttest scores that were significantly improved. Eaton noted that this study corroborates Bandura's

(1997) premise that self-efficacy is a dynamic concept that can be changed through teaching techniques aimed at raising the student's perception of self-efficacy.

Schreibner (1995) developed eight self-efficacy tools to study student nurses within the first week of nursing school. This time frame was reported by Schreibner as vital to measuring student perception of self-efficacy before actual experiences in class, laboratory, and clinical affected the student's view of real outcomes. Prior science course GPA and nursing program entry self-efficacy scores predicted 86% of the variance in the non-passing group.

The self-efficacy of new nursing teachers was studied by Nugent, Bradshaw, and Kito (1999). The sample of 346 new nurse educators completed their tool, the Self-Efficacy Toward Teaching Inventory (SETTI). Through multiple regression technique, these nurse educators displayed that the construct of self-efficacy was influenced by formal education courses, teaching experience in nursing, and other teaching experience. Nugent et al. illustrated increased teacher self-efficacy through experience; in turn, these authors stated that this sample corroborated Bandura's construct of enactive mastery.

The effect of preceptor mentoring on the graduate nursing student's self-efficacy was studied by Hayes (1998) in a descriptive correlation design. The results gave evidence that student confidence and self-efficacy were significantly related by quality mentoring of a preceptor. Hayes stated that there was significant correlation between student self-efficacy and student opinions of a positive preceptor.

Ingalls (1999) researched nursing students' opinions of self-efficacy as a confidence indicator and attempted to match this score to the clinical teaching style of instructor. There was a convenience/stratified random sampling used to gain 377 students and 48 nursing instructors in the final sample from six colleges to gain some external validity in this study. The tool was adapted to match nursing clinical competencies and was labeled the Clinical Decision Making in Nursing Scale (CDMNS). The results were impressive: The students' self-perceptions of ability was influenced by teachers' perceptions of their ability. As the student progressed farther into the nursing program, an increase in self-efficacy score was displayed. Bandura's (1997) constructs of self-efficacy sources were matched in this study, displaying teacher impact (vicarious modeling) and incremental successful experience (enactive mastery). Ingalls noted that this study has important implications for clinical nurse educator training and associate degree curricula.

Jeffreys (1998) researched nontraditional nursing students' perceptions of self-efficacy for first-semester nursing competencies. The Bean and Metzner Model of Nontraditional Undergraduate Student Attrition, along with two scales of nursing self-efficacy, was used to test 87 ADN students. The conceptual framework of this study contained academic, environmental, and background-defining variables, with self-efficacy constructs measured over specific nursing student competencies. The study objective was to predict retention and academic grade outcomes from these variables and to define interventions as outlined by Zimmerman's (1989) beliefs in self-regulation and self-efficacy improvement. The results from linear regression analysis reflected that student perceptions of academic variable abilities (study hours, study skills, absenteeism) were inversely correlated to academic achievement, $r = 0.34$, $p < .001$. Model development was attempted with three independent variables kept in the study. These independent variables of self-efficacy, environmental variables, and academic variables explained 38% of the variance in academic grades and 25% of the variance in retention.

Jeffreys and Smodlaka (1999) developed the Transcultural Self-Efficacy Test (TSET). The aim of this study was to show how self-efficacy is a dynamic concept that changes over time and nursing education experience. The sample of 544 minority student nurses was tested in first- and fourth-semester course work in order to show self-efficacy progression in transcultural nursing competencies. According to Jeffrey and Smodlaka, this tool examined "confidence beliefs" while working with clients of cultures differing from their own. The operationalized concept became the TSET, an instrument that reflected adequate validity and reliability. Jeffrey and Smodlaka stated that the TSET applied to this sample gave evidence of self-efficacy theory as a dynamic construct with increasing scores of self-efficacy from first semester to fourth semester. The work of Jeffreys (1998), Eaton (1992), Schreibner (2000), Nugent et al. (1999), Ingalls (1999), and Jeffreys and Smodlaka (1999) seem to create a picture of importance for developing increased/realistic self-efficacy constructs in educational preparation of student nurses. The use of traditional/nontraditional retention models along with self-efficacy constructs showed the amplified complexity of predicting student retention. The need for all players in higher education to understand intellective student characteristics, student self-efficacy, and the complex nature of traditional and nontraditional student persistence is evident within this collected empirical evidence.

The multifaceted role of college leadership in setting the stage for student success with regard to retention theory and research is worth examining. To this end, best practices for retention of college students are explored, associating higher education leadership responsibility with regard to student success in the next section of this paper.

Best Practices in Higher Education
Student Retention

The vision of the community college, as written by Terry O'Bannion in his book *A Learning College for the 21st Century* (1997), revolves around students and their successful completion of their academic goals. O'Bannion depicted 2-year colleges as learning communities with students at the center of intended outcome measures. O'Bannion directed all community college stakeholders to clear away the involved hours of committee process, territorial arguments about curriculum ownership, and inflated speeches, and to focus instead on practices that have been shown through research to enhance student success. O'Bannion posed a piercing evaluative question on all proposed time and money expenditures: Does this committee advisement, budgeted item, or administrative decision help students to succeed at their academic goals? O'Bannion directed administrators to focus on their students by reviewing any new or existing collegiate policy, curriculum process, or administrative requirements by which students are impacted. O'Bannion advised the following outcome benchmark test before institutional commitment: Does "this" enhance or improve student learning and success?

The situation of best practices in higher education is reviewed in this literature search to embrace the changing demographics and the picture of student persistence and retention. First, empirical evidence is used to show a projection for the future collegiate demographic. By comprehending the diversity of those whom we will educate and serve, we can best place our efforts where they will be needed most (Tierney, 1992). Second, best practice literature is included in this literature review as an administrative synopsis of cost factors for lost income due to student attrition. A formula for lost revenue is compared to establishing a comprehensive retention program. Exploration through multicultural research findings is included, particularly the concerns of Hispanic, Black, and Native American students. Program models from the literature using remedial and developmental courses for best student retention practices are listed. The specific community college minority student concerns and multicultural curriculum infusion aimed at best practices for persistence and retention are summarized from the literature. The final section of best practices examines nursing best practices models and the literature of research study relevant to student retention.

Impact of the Changing Education Consumer

The impact of the changing education consumer is discussed in terms of (a) our future student, (b) cost factors of attrition, and (c) minority issues in retention.

Our future student. Statistical evidence of demographic changes predicted for college in the next 50 years is summarized by Murdock and Hoque (1999) as an older student with more diversity and less monetary affluence. They wrote that the two contributing factors of population growth will be immigration and agedness of the populace. Murdock and Hoque reviewed recent trends of the 1990s, and their summary from census trends revealed that the immigration rate has accounted for a 30% increase in the total population of the United States over the past decade (p. 6). The countries of origin have changed over the past 50 years, now exhibiting that 50% of these immigrants are from Mexico or Latin and South America, 30% are Asian Pacific, and 15% are European. Day (1996) projected that in the next 50 years the net growth of the United States will be 0.77% each year, with 55% of that growth due to immigration. Day based his 55% minority growth over the next half-century to actual immigration and the increased birth rate of descendants from recent immigrants in the late 1990s.

Murdock and Hoque (1999) reminded college administrators that the United States would be expected to provide these immigrants with the essential service of education. These authors forecast a populace becoming 45% minority during the years 2000 to 2050 and the composition of future minority college students increasing proportionately. Day (1996) projected that the greatest characteristic change in enrollment will be from students who are 30 years of age and older. Murdock and Hoque (1997) noted that the financial need of students is expected to increase due to a real income of $2,000 less than in 1990 (real-dollar) calculations. The regional growth patterns were noted by Murdock (1995) to be 88% in the western and southern United States, rather than the

Northeastern and Midwest, where viability of college institutions is rarely ever questioned.

The higher education implications of statistical census projections, according to Day (1996) and Murdock and Hoque (1997), are providing college services for students of greater socioeconomic need, carefully considering regional patterns of growth rate before expansion, and giving attention to the changing demographic of the minority/older student. The final consideration for higher education administrators was made clear by Murdock and Hoque to plan for a population that will be more educationally challenged due to technology advancement. These authors stated that to fail at retaining the minority student within the ranks of higher education would result in a reduced overall level of population education at the time when the demand for knowledgeable workforce would be at its highest in the United States.

Cost factors of attrition. Seidman (1991, 1996, 2000), known for his assertive seminars on the cost of attrition, has clarified persistence through a formula for university and community college best practice for retention. Seidman' s formula for retention is: R = (E)(Id) + (E)(In)(Iv), that is, Retention (R) = Early (E) Identification (Id) + Early (E) Intensive (In) Intervention (Iv).

Levitz, Noel, and Richter (1999) identified the costs of attrition to colleges as three-fold, including student losses, financial losses, and image damage that is hard to calculate. Noel et al. developed a complex formula for 2-year public colleges for freshman students. Their prediction of low-end attrition is 30% up to high-end attrition at

45%. Attrition is a staggering loss in lost revenue to the community college. Seidman (2000) has a Web site that corroborates this calculation of financial losses at $10,000 per student per year. Seidman noted that the average progression of a community college student presently is 3 years. Noel et al. and Seidman claimed monetary losses as having a severe multiplying effect over a student body with the usual 30-45% attrition rates for freshman community college students. The work of Noel et al. and Seidman placed the figure for a starting enrollment of 1,000 freshman students (30% = 300 students lost to attrition) at near a million dollars by the end of 3 years. The development of a comprehensive persistence and retention program when comparing institutional outlay to per capita lost student revenue is forecast as a positive payout for instituting a retention program. The concepts of institutional fit, intrusive intervention, comprehensive college retention models, and student services functions were enumerated by Seidman, Fitzsimmons, Kelly, Arrington, and Noel and others, as described below.

Seidman (1991, 1996) wrote of institutional "fit" by identifying this concept as relevant to all institutions of higher learning. The early 2-year models of community college assigned students for attendance, according to Seidman (1991), on geographic community location, assuming that all community colleges were alike. He contended that mismatching of a student to a college that has few faculty role models, a small number of services for minority students, a small number of peers with like diversity, and limited technical/certificate programs can hinder successful outcome due to lack of integration and actual student aspiration/fit (Siedman, 1996).

Siedman (1991) used intrusive intervention with students at Parkland College in Illinois. He explained that this concept of advising and counseling must be done proactively and completed with early identification to develop an "at-risk profile." The community college student in Seidman's intrusive intervention program received prescriptive academic skills and/or tutoring programs. He also promoted that a freshman orientation course concept be used in community colleges, much like a University 101 class is a requisite for 4-year college students before their first fall semester.

Seidman (1991) and Fitzsimmons and Kelley (2000b) developed comprehensive models for university and community college student retention and persistence success, which included academic factors, administrative service factors, and student life factors. Seidman (1991, 1995) and Arrington (1996) researched retention model outcomes and found that a comprehensive strategic college initiative yielded improved student success over department grants and short-term solutions. Seidman (1995) viewed the two domains of college recruitment and retention activity as a continuous circuit, not two separate institutional functions.

Seidman (1989) and Arrington (1996) detailed that a persistence plan can display best practice only when matched to research instruments. Subcategories of academic climate (teacher learning process and faculty student interaction) and programs of curriculum and academic policy were examined in a comprehensive research plan. Siedman (1989) explored retention research in the administrative realm by studying administrative service factors of climate (treatment of students), support systems, and administrative policy. Student integration prompted creation of programs addressing

Hispanic, Black, and Native American issues of retention. William Tierney (1996) wrote of the "meaning of college administrators' words" in his article "An Anthropological Analysis of Student Participation in College." In one salient example he dissected a common phrase about minority student persistence: "They have a terrible time with acculturation." Tierney interpreted these frequently expressed words and inferred that the minority student has the "acculturation problem," excluding the college/teacher/counselor from accountability. Tierney shed light on the problem of "acculturation," which is not minor but is defined to be of "terrible" proportions. In this exercise of word deconstruction, Tierney hoped to accomplish understanding for Indian minority issues. Tierney's qualitative techniques of conceptualization and de-conceptualization offered insight into the general mindset of many college stakeholders. Accountability for minority student persistence appeared to Tierney to place ownership squarely on the student instead of an inability of higher education to function in a pluralistic cultural world.

A best practice for minority retention and persistence holds accountable all college stakeholders and necessitates movement past finger pointing at students, dualistic thought of one simple intellectual correlate of persistence, and research that is based upon asking erroneous questions (Tierney, 1996). Attinasi and Nora (1992) advised that research of minority persistence issues be done through use of quantitative and qualitative methods to gain insight into a racially pluralistic student body exploring a more accurate view of complex retention issues. Best practices for persistence and retention that are based on culturally biased student theory give flawed research results of the 2-year college student while offering little valid suggestion toward minority student success (Attinasi & Nora; Tierney).

The intricacies of minority Hispanic student issues were studied in quantitative approach by Nora (1987) and in qualitative format by Duran (1987) and Attinasi (1989). The work of Nora used the Tinto theoretical framework of student integration for 2-year students over a causal model of academic/social integration, goal commitment, pre-college background, and withdrawal decision. Minority student results in Nora's study showed that a great deal of the variance for Hispanic students can be explained by this model. The 2-year Hispanic student results only partially supported Tinto's framework of these four causal variables.

Duran (1987) interviewed Hispanic students and noted trends of underrepresentation and underachievement for the Hispanic minority when compared to the non-Hispanic Caucasian demographic. Attinasi (1989) interviewed in a naturalistic setting persisting and nonpersisting Hispanic students. The conceptual schemata that evolved from student answers were analyzed and grouped into "getting ready" and "getting in" contexts. The issues of "getting ready" included witnessing early in life a college-going family member, pre-college visits, and vicarious goal-identification communications with high-school teachers. The "getting in" issues involved the process of adjustment to academic life. The Hispanic persisting and nonpersisting students differed greatly on "getting ready" and "getting in" concept experiences, and Attinasi posited that these are important to Hispanic minority persistence.

The combination of quantitative survey and qualitative examination of natural processes prompted work from these studies for a new causal model by Nora, Attinasi, and Matonak (1990). Modification of the Tinto integration model with "getting ready" measures for community college students gave evidence of a hastened process time for Hispanic student transfer to a 4-year college. The best practices have evolved from Duran's (1986) and Attinasi's (1989) "getting ready" schemata for Hispanic students. "Getting ready" themes from qualitative research have prompted the advancement of Kindercarminata (introduction of 5- and 6-year-olds to community college), continuous on-site placement of joint high school and community college counselors, partnerships for colleges to identify high schools with Hispanic at-risk students, and sharing of counseling-teacher-parent involvement in local high school-to-college conferences.

Diversity and Best Practice Retention Efforts

Diversity and best practice retention efforts are discussed in the following sections: (a) outcomes of remedial and developmental best practices, (b) community college best practices research, (c) nursing education best practices, and (d) opposing retention research.

Outcomes of remedial and developmental best practices. The issue of remedial education for minority and nonminority students is documented by the National Center for Higher Education Statistics (NCES, 1996) as a best practice with remedial courses (pre-college level) and developmental education (academic college-level skills).

NCES statistics showed conventional U.S. higher education classes of remediation and developmental study present at 75% of universities and 100% of community colleges, giving evidence of this best practice as widely accepted. According to Boylan, Bonham, and Bliss (1994), the participants in remedial and developmental education reflect that two thirds of participants are Caucasian students and one third are minority students. Best practices guidelines for remedial and developmental education were synthesized by Boylan, Bonham, and White (1999). Their findings, supported by empirical evidence, were as follows:

1. Implement mandatory assessment and placement (Roueche & Roueche, 1999).
2. Promote holistic and involved institutional commitment (Boylan & Saxon, 1998).
3. Enforce strict attendance for developmental courses (Boylan & Bonham, 1999).
4. Abolish late registration for developmental and remedial students (Roueche & Roueche, 1993).
5. Focus on metacognitive skills (Weinstein, 1998).

The outcomes for participants of developmental courses reflect students who are more likely to be retained (Boylan, Bonham, Claxton, & Bliss, 1992). Research on developmental study participants completed by Boylan et al. (1992) gives evidence of 66.4% passing grades with significantly improved retention in first-year courses. Research by Boylan and Saxon (1998) examined Texas college students for placement in specific developmental subjects. Their report of the Texas Academic Skills Program (TASP) illustrated a breakdown of students attending: 45.4 % reading courses, 55.0% English courses, and 33.4% of mathematics courses. The community college studies of 1-year retention for students receiving specific developmental courses following TASP assessment give evidence of improved retention through the critical first year of college attendance. Casazza and Silverman (1996) researched the use of a "theory-based" developmental course program as compared with separate departmental initiatives. Findings showed a marked improvement in outcomes, with theory and model guidelines for teachers, counselors, and administrators based within sound comprehensive pedagogy.

Community college best practices research. The recent approaches to community college retention and attrition best practices were identified by Brawer (1996) as identifying characteristics of persisters and nonpersisters, intervention strategies, orientation programs, and mentoring programs. Brawer advised that the identifying characteristics could lead to early intervention strategies for at-risk students with proactive counseling, developmental education referral, and college goal clarification. The research of Mohammadi (1996) explored retention and attrition through longitudinal patterns in a 2-year college and demonstrated that Black minorities at the 1-year mark reflected 21% retention, compared to 30% for Caucasians. Older nontraditional students had a slightly poorer rate of retention, according to Windham (1994) and Mohammadi. Conversely, Feldman (1993) found that younger students were not retained in higher numbers in the age ranges of 20-24 years. The use of characteristics is complex, according to Brawer, and care must be taken to not limit characteristics to age, gender, major, or race, as this may leave out many at-risk students who do not fit a simplistic student profile.

Extended orientation programs that involve cohort formation have been studied by Nelson (1993) and found to have better results, with 81% cohort retention programs as compared to 56% non-cohort retention programs. After four terms in Valencia Community College, use of the extended orientation program yielded 65% retention. Freshman experience programs that incorporate remedial and developmental studies report a 10% increase over orientation programs that do not have this academic integrated focus. The freshman experience is meant to be comprehensive, with personal/social counseling with intrusive advising done in trained mentorship programs such as the SELECT advisor program of Coffeyville Community College, Kansas (Clark, 1995). The importance of student counseling and faculty mentoring within a trusting relationship is documented by Astin (1996), Clark, Nelson (1993), and Tinto (1993). When writing of retention in community colleges, within his second edition of the text *Leaving College*, Tinto (1993) focused on the process "to bridge the gap" from a commuter-urban life toward an academic community. Tinto acknowledged the unique burden on community college stakeholders to create a learning community.

The issue of student financial aid as a determinant of community college student retention has been explored by Nora (1990). Her findings, specific to the Hispanic minority student, reflected a missing variable in many retention models and studies. Nora found financial need to be a significant impact variable for the Hispanic community college student. Nora found that many Hispanic students overestimated their parents' income and prematurely decided that they did not qualify for aid. Nora's findings are replicated in studies by Feldman (1993) and Voorhees (1985). These authors recommended that retention best practices include financial aid awareness by all college personnel, with information dissemination to start in high school or at first application for the nontraditional adult student.

Rendon (1996) explored the nontraditional student with first-generation characteristics. Rendon profiled the hardships of Hispanic students through qualitative interviews and portrayed the lives of students entering this country for higher education and the severe hardships that they encounter. Rendon's qualitative "thick-description" research of the internal strife of loneliness within the Hispanic family that leads to ambivalence about college was a stirring reminder of the depth and complexity of minority student issues. The PLACe tutorial program at Miramar College of San Diego considers a comprehensive college-wide approach to retention by implementing collaborative styles between students, counselors, faculty, and peers (Fink & Carrasquillo, 1994). Comprehensive retention programs utilizing retention strategies that are early, holistic, and sensitive to minority need claimed highest retention improvements (Brawer, 1996).

Curriculum models of multicultural infusion best practice. The best practices for curriculum revision that aid in diverse student persistence were enumerated by Morey and Kitano (1997) within their text *Multicultural Course Transformation in*

Higher Education. Wallin (1997) contributed the community college chapter to this text and discussed the term "multicultural infusion." Wallin's perspectives of multicultural curriculum change were to transform curriculum in an additive, inclusive, and nondominant direction. Wallin stated that multicultural broadening in community college curriculum welcomes the open admission student who may be an immigrant, first generation in this country, or underrepresented in mainstream demographics. Wallin warned the multicultural committee chairs and curriculum change agents to adopt a sound transcultural theory for the reason that implementation takes years before real institutional impact is realized.

Banks and Banks (1995) noted that minority students reported feeling left out of college assimilation because they did not experience recognition of their culture. Banks and Banks developed four distinct levels of pluralistic curriculum infusion, starting at celebration of heroes and holidays, adding multicultural literature, transforming curriculum permanently, and using a holistic collegiate social action approach. Banks and Banks stated that their research showed the community college as the place for a diverse student to feel legitimized and included due to the pluralism already in existence within the classroom. These two authors have researched curriculum infusion, and their best practice results implied that to get a school into level four of "social action" requires years of administrative effort. Banks and Banks suggested starting with early freshman experiences of pluralism. They recommended a learning atmosphere that is respectful of divergent "frames of reference," with a nondominant cultural theme be in existence in classroom discussion. Multicultural investigation assignments done in collaborative work groups integrate minority students into the academic and social college environments.

Morey (1997) wrote of faculty development necessary for acceptance of the multicultural curriculum change. The faculty, often of European descent, may wish to cross barriers toward students by including assignments related to pluralistic student differences and similarities. According to Morey, students may test the sincerity of faculty concerning pluralistic values by challenging them openly in class. Morey stated that multicultural infusion first requires faculty to work out their own "politics of difference" before approaching students. This period of self-reflection is essential to faculty so that later classroom interactions can be managed with sincerity. Morey stated that successful future skills of all students in today's global world demand that education in the community college show a tolerance for diversity and gain proficiency in social community action.

Nursing education best practices toward student retention. Lockie and Burke (1999) examined the Partnership in Learning for Utmost Success (PLUS) retention program designed for at-risk nursing students. Their study in the Midwestern United States had 121 students in the treatment group and 89 in the control group. These students were all judged to be at risk due to intellective characteristics at or below advised minimum entry GPA and assessment test scores. The PLUS participants were significantly successful in retention, and they improved in cumulative GPA and graduation rates.

Peter (1996) studied the Learning for Success (LFS) program aimed at retention of nursing students with a focus on faculty advisement as the core component. The Nurse Entrance Test (NET) critical thinking score revealed statistical outcomes as a significant determinant for RN students with at-risk status. This dissertation reflected that the LFS students were academically successful and that the faculty advisor components of the program were helpful in making students feel efficacious.

The loss of minority students in greater proportion than their Caucasian counterparts has been documented by Fitzsimmons and Kelly (2000b). Nursing student minority and ESL best practice research are explored next to highlight unique concerns for this demographic. Abdur-Rahman and Gaines (1999) studied the minority student retention program at Prairie View A&M University in Texas, examining the outcomes of the Retaining Ethnic Minority Nursing Students (REMNS) project. The retention program, aimed at preclinical nursing students, provided strategies to improve critical thinking, stress management, and reading comprehension skills. Development and implementation of content-relevant computer modules on stress management, nutrition, and critical thinking completed this comprehensive model. The findings of Project REMNS resulted in a significant increase in prenursing students admitted and retained in the nursing program.

Hesser, Lewis, Abbott, and Vericella (1993), at the Medical College of Georgia, studied the Minority Academic Advising Program (MAAP). The MAAP is a retention program for Black students within the School of Allied Health Sciences (SAHS). The study sample consisted of 89 Black students who enrolled fall 1978 to fall 1982 (pre-MAAP period) plus 129 Black students who entered the SAHS from fall 1984 through fall 1988 (MAAP period). The comparison consisted of all other students who entered the SAHS ($n = 1,884$) within those same periods. MAAP program use reflected increases in Black student retention-to-graduation rate and time-persisted-in-program to the extent that Black students achieved parity with other SAHS students.

Condon (1996) studied the success of culturally diverse BSN students, obtaining a substantial sample of 770 diverse students (90 African American, 197 Asian American, 242 Caucasian, 209 Latino, and 32 Native American). The factors that students identified as most helpful in their student success were motivation and commitment, support and encouragement, and caring helpful faculty. The authors noted that the greatest barriers, according to students, were inadequate finances, lack of flexible school policy, and overworked between-class and clinical commitments. Implications for faculty development, flexible school policy, and a realistic appraisal of time commitment while in the program were administrative policies considered at the 22 colleges involved with this study. Fitzsimmons and Kelly (1996) wrote an NLN book entitled *The Culture of Learning: Access, Retention, and Mobility of Minority Students*. Numerous chapters of this volume from nursing experts triangulated the same suggestions for minority student retention that were found in the Condon dissertation study.

The nontraditional student, as defined by Bean and Metzner (1985), has increased in percentage of total nursing students. Coleman (1993) also wrote of the increased number of minority students in nursing education and their poor retention rates. A study by Arenson (1997) addressed the concerns of the minority/nontraditional nursing student. The focus centered on the concept of overwork and time constraints of older students who were parents and had more than part-time jobs. These demands of vital community concern were considered in addition to the class and clinical time required for nursing studies. The time commitment necessary solely for nursing clinical competencies was considered extreme when added to family and life-sustaining functions. Best practice modifications for nursing programs centered on allowing a longer time from entry to program completion. The flexible design of clinical scheduling. along with removing a rigid semester calendar. improved nontraditional student retention and RN program success in Arenson's analysis.

A study of nursing instructor collaboration with nursing students. considering Bandura's concept of self-efficacy. was done by Puksa (1999). The effect of teacher self-efficacy on students in a humanistic-educative curriculum was compared to student self-efficacy in a traditional nursing curriculum. Bandura's vicarious learning by witnessing a caring efficant role model was significantly evident in student response within the humanistic-educative curriculum. Implications for best practice for faculty development were identified as learning self-efficacy theory and how role models displaying self-efficant behavior may influence through vicarious observation a student's perception. coping. and persistence in learning.

Watkins (1997) studied the interaction of faculty and students through qualitative open-ended interviews. Seventy-four senior students gave data concerning their nursing faculty that identified characteristics of the most desirable nursing teachers as being "firm but fair." supportive in academic challenges. and flexible. The least helpful faculty characteristics were lack of clinical knowledge, inflexibility, biases, and an uncaring demeanor.

McGregor (1996) elected the qualitative format for study of socialization issues in nursing student education. McGregor wrote critical analyses of how success and failure are negotiated in nursing education and, by this unfavorable account, exposed the socialization process of student nurses. Data triangulated in interviews with student, faculty, and administrators revealed major themes for consideration and change for better practice. The themes of "chameleon role," "silence to authentic voice" of caregivers, ideology versus real practice, and imbalances in faculty/student power were put forth for substantive change.

Abriam-Yago, Yoder, and Kataoka-Yahiro (1999) examined best practice models for English as a Second Language (ESL) nursing students. The Cummins Model for English proficiency provided the best framework for nursing faculty in developing academic support necessary for ESL nursing student success. Klisch (2000) presented a 9-year literature review of nursing education and ESL student retention strategies. Her findings of ESL approaches reflected that these comprehensive programs for ESL students were expensive, time consuming, and labor intensive. The cost of this one-on-one student tutoring can be prohibitive to college institutions. Klisch summarized the necessity of improving ESL nursing student retention. Klisch further noted the benefits for the common good to be able to converse with a caregiver in a natural tongue when ill. Klisch posited the need for large-scale state and federal funding to support ESL student retention initiatives for allied health education institutions.

Best practices for multicultural student retention were summarized by Arrington (1996) in her report of research done by the Sallie Mae National Retention Project. The schools that Arrington examined had an increase in graduation rate of African Americans, Latinos, and Native Americans. Arrington's concerns was an apparent lack of institutional commitment evidenced by permanent funding, even though these excellent outcome results were demonstrated. Catalano and Eddy (1993) researched NLN schools and found that nursing programs with a retention program had a statistically significant higher retention rate (70.7%) than those without retention programs (56.2%). Arrington posited that, although progress was being made by grants, an authentic institutional commitment must be demonstrated by integrating programs into the campus culture with long-term funding to impact student success.

Fitzsimmons and Kelly (2000a) reported on the Transcultural Learning Continuum (TLC) project involving four nursing programs. Their results showed improvement in outcome of minority nursing graduates. Fitzsimmons and Kelly summarized that the best practices of the TLC project were early intensive learning strategy/developmental education, students gaining a sense of connectiveness through peer and faculty bonding, minority role models, and flexible scheduling that accommodated family and work responsibilities. The apparent best practice implications for higher education leadership within community college and nursing education would be the following: (a) obtaining permanent retention initiative funding, (b) faculty development toward sensitization to minority/nontraditional student realities and self-efficacy pedagogy, (c) transforming the nursing student socialization process, (d) providing peer group clubs for bonding and support, (e) early mandated developmental education with meta-cognitive skills and cohort involvement study groups, (f) creation of flexible policy in semester/calendar and part-time clinical, and (g) recruitment and hiring of minority role models (Arenson, 1997; Arrington, 1996; Catalano & Eddy, 1993; Coleman, 1993; Fitzsimmons & Kelly; McGregor, 1996; Puksa, 1999; Watkins, 1997).

Opposing retention research. The literature on higher education retention research consistently gave a conceptual assumption that retention is a noble and desirable progression for all students. The research of Rummel, Acton, Costello, and Pielow (1999) questioned that all retention is good. Their post hoc study of student records in a New York university followed the reasons for student departure and found that many of the nonpersisting students left for honorable reasons. Rummel et al. noted that students who departed had the following valid rationales: (a) not academically suited and suffering negative self-image; (b) lack of desired major; (c) class size too large for their learning needs and style; (d) comparative shopping at another institution with financial scholarship; (d) personal illness, pregnancy, or family needs; and (e) developmentally immaturity to engage in college environment/study. While these authors voiced concern for departing students and their need for retention services, their research entered into an alternative thought paradigm that many institutions and research studies fail to address. The concept that a student may depart for valuable reasons and may not require retention services was suggested to college administrators when designing retention programs and exit surveys for students.

CHAPTER 3

METHODOLOGY

This chapter presents the methodology applied in this study. The sections address the sample, the design and procedures, the instrumentation, and data analysis. Methodological assumptions and limitations of the methodology are also addressed.

Sample

The sample collected was a voluntary purposeful group with intensity toward including traditional and nontraditional students nursing students (as operationalized in chapter 1) in their first semester of nursing school. The sample desired was obtained and was a representative demographic for western United States community nursing programs with respect to student demographics. The sample consisted of 225 participants, with 14 removed due to entire tools missing data. The final sample numbers were 211 first-semester traditional and nontraditional students enrolled in western United States community college programs of ADN. The sample was used for descriptives, correlations, comparison *t* tests, and multivariate statistical analyses toward an outcome prediction formula and group classification.

Design and Procedures

The voluntary sample was given an informed consent approved by the Human Subjects Institutional Review Board (see Appendix A) and a code to conceal their identities. Consent from six participating schools was obtained from the division dean, nursing director, and interested faculty. The subjects were surveyed using the three instruments within the first 3 weeks of their RN program. The instrument collecting demographic data (see Appendix B) was completed first. The adapted Bean and Metzner inventory of nontraditional student concerns labeled the Student Perceptual Appraisal (SPA) toward a grade of "B" was completed next (see Appendix C). The sample was then given Jeffrey's adapted Self-Efficacy Strength Test (SEST), designed specifically for first-semester nursing students and labeled the Nursing Skills Subscale (NSS) and the Educational Requirements Subscale (ERS; see Appendix D). The SPA was repeated, with the goal of "pass" or retention in the nursing program.

Students were involved for the process requiring 30 to 45 minutes to complete the surveys at their respective ADN community college sites. The students were asked for intellective academic variables of pre-nursing science GPA, HSGPA, reading/English and math assessment test results, advisement, and remedial and developmental courses taken prior to nursing program entry (see Appendix E).

The students were informed that their retention in the program and achievement would be tracked by their anonymous code at 8 weeks and at the end of the first semester, and that this information would be retrieved from their director or faculty designee. The students were assured that no consequence for being a participant or refusing participation would occur. The students were given a lunch meal and two dollars for their completed surveys. The researcher remained available to students during surveys and lunch meal to answer questions and review completeness of surveys.

Collection of data occurred according to the research design twice at all six school sites. Freshman faculty designates confidentially communicated the students' outcomes at both the 8-week and 16/18-week time frame by reporting student numeric grade, letter grade, and retained/nonretained status. This researcher encountered a difference in school procedures at the 8-week outcome data collection point. This rendered 8-week outcomes unstable and not reliable between the school sites. To secure consistency, the 8-week outcomes were not used, and only end-of-first-semester (16/18-week) numerical grade, letter grade, and retained/nonretained status were used in correlations and multivariate calculations.

Instrumentation

This researcher gave the sample a survey packet consisting of four tools consisting of demographic items, student recollection of intellective variables, self-efficacy strength (SEST with subscales of NSS and ERS), and student perceptual appraisal (SPA) concerning environmental impact factors. The students self-reported their intellective measures of pre-nursing academic work. The intellective measures, including community college assessment test results, advisement, and remediation collected from each student, were intended to give a wide-ranging insight toward prediction of nursing student successful outcome. The SPA was adapted from Bean and Metzner (1985) and revised to fit the ADN student. The SEST is theoretically based upon work by Pajares (1992), Zimmerman (1992), Bandura (1997), and Jourden (1991). The SEST has been adapted by Jeffreys (1998) for use in two research studies of freshman nursing students to date and peer reviewed for content validity.

Intellective Measures

The intellective measures of nursing students were operationalized by collecting, after informed consent, their recollection of HSGPA or GED certificate (Ehrenfeld et al., 1997). The pre-science course average has been identified by Glanville (1989) as highly correlated to nursing student success. The response obtained from pre-science Anatomy and Physiology (A&P) GPA was recorded for correlation and predictive relationship in this study. The number of times the Anatomy and Physiology course was repeated to attain a necessary entry science GPA was considered and became a part of the intellective inventory. The reading assessment and math assessment of nursing students prior to community college and nursing program entry has been noted by Rubino (1998) as highly correlated to student GPA in the first semester of the nursing program. The reliability of reading assessment as a predictor of program completion was documented by Rubino as the highest correlate to successful student outcome and passing of the licensure exam, NCLEX-RN. However, consensus of intellective measures as the singular and only correlate of nursing student retention (prior academic HSGPA and science course GPA) has been challenged in the literature by Jeffreys (1998), Neville (1993), and Tierney (1996). These basic methods of aptitude assessment are considered by many authors quoted in the conceptual framework as essential. Toward a holistic picture, the intellective inventory was collected from the pre-nursing student with an eye to this science/math/communication-driven health care major.

SEST Measure

The SEST has two subscales (NSS and ERS) that identify specific first-semester competencies for beginning nursing students. The dimensions of specific fundamental nursing course content are defined throughout the nursing skill subscale (NSS) created by Jeffreys. The categorization of nursing skills as the eight vectors of freshman nursing is done under the following eight clinical behavioral headings: (a) communication, (b) technical skills, (c) physical assessment, (d) medications, (e) teaching, (f) collaboration, (g) documentation, and (h) professional development. The 6-point scale has the following anchors: 1 = *a little confident*, 2 = *somewhat confident*, 3 = *rather confident*, 4 = *very confident*, 5 = *virtually certain*, and 6 = *absolutely certain*. The ERS is a 10-point pole scale that focuses on the degree of confidence in achieving selected tasks. Students are asked to rate what they believe they can achieve despite any obstacle or hardship and to assess their ability to expend whatever amount of energy and time is required to accomplish the tasks of freshman nursing. Tasks include successful attendance at class/clinical/lab, written and computer assignments, reading and study, and testing grade performance (Jeffreys, 1998).

The reliability of the Jeffreys researcher-constructed and peer-reviewed instruments yielded a scale test-retest set of coefficients over a 2-week period = .90 ($N = 30$)

and .85 ($N = 32$) for the NSS and ERS, respectively. The total variable of self-efficacy is referred to as self-efficacy strength test (SEST). Scoring of the SEST is calculated for each scale. The SEST is the average confidence rating (sum of all items scored divided by the number of items). Possible scores for the NSS range from 1 to 6; possible scores for the ERS range from 1 to 10, and are weighted to be averaged together on the NSS scale of 1 to 6. The calculation of the overall SEST average yields a score of 1 to 6, with 1 reflecting significant uncertainty of self-efficacy and 6 reflecting the maximum confidence of self-efficacy toward the successful completion of academic and clinical competencies required in freshman nursing (Jeffreys, 1998).

Environmental Impact Measures: SPA

The students appraised their perception of select nontraditional college student variables of environmental impact (academic ability dynamics, life commitment obstacles, and background-defining factors; Bean & Metzner, 1985). These environmental impact variables focus on the older (> 26 years) diverse student who may have multiple community demands outside of college life. The student appraises how these common nontraditional student concerns (total of 42 items) are judged to be restrictive or supportive in academic achievement and retention. The environmental impact scales are rated over a 6-point Likert-type scale ranging from *Does not apply* to *Greatly supports* in the SPA. The student does this scale twice: once toward accomplishment of a "B" grade and next toward a minimum "pass" grade. The SPA is a combination of 11 questions indicating environmental impact variables and 10 questions indicating academic variables. These can be scored separately as academic variable strength test (AVST) and environmental variable strength test (EVST).

The two 21-item scales have a minimum score of 1 and maximum score of 6; they are calculated separately and averaged for a total SPA score. The separation of AVST and EVST scores can be done as a subscale per each SPA. Each of the 10 academic student appraisal scores and 11 environmental student appraisal scores can be added to obtain a total range of 10 to 60 on AVST and 10 to 66 on EVST, respectively. The SPA then yields four distinct scores with SPA "B" correlated to academic achievement outcomes and SPA "Pass" correlated to the retention/nonretention outcomes (Jeffreys, 1998).

The adaptation of the Bean and Metzner SPA by Jeffreys was studied for reliability and peer reviewed for internal content validity. The test-retest reliability coefficients for a 2-week interval (*N* = 33) were .76 and .82 for environmental variables on retention and academic achievement, respectively. The test-retest coefficients for a 2-week interval (*N* = 33) were .65 and .63 for academic variables on retention and academic achievement, respectively (Jeffreys, 1998).

Data Analysis

The data were collected on bubble scoring forms, coded, and prepared for computerized analysis using a major computer statistical analysis program. Planned analyses of data from all four tools were done to yield descriptives. The Pearson Product Moment Correlation procedure was carried out to determine a correlation matrix of significant relationships for continuous data over variable means and totals. Rank difference (Rho) and biserial (r_{bis}) correlations were completed as ordinal data and nominal data indicate. Multivariate statistical procedure using multiple regression and discriminant analysis were done (Isaac & Michael, 1997). The continuous dependent variable of scores on academic outcome achievement and the nominal data of retention and nonretention found as outcomes at weeks 8 and 16 were analyzed toward the three categories of predictor measure: (a) intellective characteristics (science GPA, HSGPA, reading and math assessment score); (b) environmental impact characteristics of the SPA instrument (summed and averaged, AVST and EVST totals on both SPA "B" and SPA "Pass"); and (c) SEST summed and averaged from the NSS and ERS subscales. Sample size was adequate for creating subgroups of traditional and nontraditional students and allowed comparative mean analyses by *t* tests for statistical difference (Gall, Borg, & Gall, 1996).

A model of prediction was tested from all of the above statistics. Due to the nonrandom convenience sample and the limited sampling procedure, the results may only infer correlates of significant interest and possible impact toward academic achievement and retention. This researcher aims for a more comprehensive investigation of intellective, environmental impact, and self-efficacy student characteristics through a potential model.

A summation of the variable type, instruments/measures, and planned statistical tests is found in Table 2. This study aimed to reproduce in part the Jeffreys work by using these instruments (demographic survey, NSS, ERS, and SPA) and added intellective

Table 2

Variables

Variable type	Variable/instruments/measures	Statistical tests
Predictor variables	Intellective characteristics (science GPA, HSGPA, reading and math assessment/advisement and remediation, times A&P Science repeated) Environmental impact variables (AVST and EVST subscales of SPA Tool, repeated twice as SPA B, SPA Pass) Self-efficacy appraisal (SEST Tool with two subscales: NSS, ERS)	Descriptives Independent samples *t* test Multiple regression Simultaneous entry Hierarchical entry
Criterion variables	Academic achievement (numerical grade at end of semester) Retained /not retained (Retained or reason for program departure at 8 weeks and end of semester)	Descriptives Correlations Multivariate analysis: Multiple regression Simultaneous entry Hierarchical entry Crosstabs/chi square Multivariate Analysis: Descriptive/Predictive Discriminant Analysis
Control variables	Demographic Survey (traditional/nontraditional status, ethnicity, gender, age, income)	Descriptives, correlations, crosstabs/chi square, ANOVA, independent samples *t* test

Note. GPA = grade point average; HSGPA = high school grade point average; A&P = anatomy and physiology; ANOVA = analysis of variance; SPA = Student Perceptual Appraisal; AVST = academic variable strength; EVST = environmental variable strength; SEST = Self-Efficacy Strength Test; NSS = Nursing Skills Subscale; ERS = Educational Requirements Subscale.

variables as another vector of potential inference toward prediction of nursing student retention and academic achievement. The Jeffreys sample ($N = 87$) did not obtain the desired demographic originally planned for investigation within the New York ADN college site (Jeffreys, 1998). The present study accomplished a sample composition with a representative diverse demographic reflecting the populace changes within community colleges in the western United States.

Methodological Assumptions

The following methodological assumptions were implicit in this study.

1. Sample size and demographics were representative of community college nursing programs.

2. Statistical procedures employed in data analysis were appropriate to obtain the evidence necessary to answer the research questions.

3. Measures employed were sufficiently reliable and valid to afford a limited degree of inference for cautious generalization of findings.

4. RN student (self-appraisal) self-efficacy/environmental impact data were provided as genuine and valid judgments to the best of their ability.

5. Student recollections of prior intellective measures (HSGPA, science GPA, and remediation advisement in mathematics, English, and reading) were reported accurately by each student.

6. Teachers reported student academic achievement and retention data accurately for each student.

7. The reliability and validity of the survey instruments and outcome measures were sufficient to permit accurate inferences about student characteristics and successful academic outcomes in the first semester of a nursing program.

Limitations of the Design

The following limitations posed a possible threat to internal and external validity of this investigation:

1. The sample, although deemed representative of the western United States RN student population, was not randomly drawn.

2. The nursing instructors, although qualified to make academic achievement and clinical pass-and-failure evaluations, were not given strict evaluative criteria by this researcher for final academic grade assignment or clinical pass or fail. This study, done within the natural settings of these RN programs, may have some interference with reliability and validity of correlations of academic achievement and retention.

3. The students may have interpreted the questions within this study differently from intended. Misunderstanding of instrument items could render these instruments of SPA, ERS, and NSS less valid or reliable than previous studies have demonstrated.

4. To the degree that the methodological assumptions of the study were not met, the internal and external validity of the study would be limited.

CHAPTER 4

ANALYSIS AND DISCUSSION OF FINDINGS

This chapter presents the statistical analysis results of the study and discussion of related findings. Descriptives of sample demographics and intellective, environmental impact, and self-efficacy variables were prepared. Traditional and nontraditional student subgroups from the sample were compared for means over select variables for significant differences. Correlations, linear regression, and discriminant analysis over independent variables were computed to obtain the salient student characteristics of a prediction equation for academic achievement and retained outcomes. The study questions were utilized as organizational headings. The discussion of findings is contained within each section of statistical analysis.

Study Overview

Community colleges with associate degree nursing programs in the western United States were sought, and six programs approved agreements to participate in the study. Deans, nursing directors, and interested first-semester faculty were informed of the study and signed consent to allow participation by students, wishing to volunteer for data collection, from their January/February 2001 freshman RN class. Information was obtained within the first 2 weeks of the semester at all six sites. Students were given introductory remarks as to the study purpose, and human subjects permission was obtained from 225 participants at their respective school locations. The four tools (Demographic Data, Intellective Inventory, Self-Efficacy Tool, and Student Perceptual Appraisal of Environmental Impact) were administered by this researcher over a 30-minute period. Students were allowed to ask questions. Fourteen subjects were removed form the sample due to missing data involving entire sections of their questionnaires.

Descriptives: Sample Demographics

The sample demographic count numbered 211 participants, with 35 males (16%) and 176 females (84%). The ethnicity of this sample reflected the more pluralistic demographic that has been entering nursing study in California as defined by Lewis et al. (1999). The ethnicity claimed by the sample was White Non-Hispanic 38.9%, Hispanic 28.0%, Black 9.0%, Native American 1.4%, Asian 13.3%, Pacific Islander 4.7 %, and other 4.7% (see Table 3). Definition of nursing students by traditional and nontraditional student status reflected 16% (34) as traditional and 84% (177) as nontraditional.

Student age in this sample reflected 45% (95) below 26 years and 9% (19) above 40 years. The marital status of the sample reported 34% married. The combined count of single and divorced students totaled 89 students or 66% of sample participants. Thirty-two percent of the students declared dependent children, specifically with 15.6% claiming one child, 10.4% two children, 9.5% three children, 2.8% four children, and

Table 3

Sample Description: Demographic Data

Item	*n*	%
Gender		
Female	176	83.4
Male	35	16.6
Country of birth		
USA	144	62.8
Out of the country	67	32.8
Age		
Under 21	20	9.5
21-25	75	35.5
26-30	57	27.0
31-35	27	12.8
36-40	13	6.2
41-50	17	8.1
Over 50	2	0.9
Marital status		
Single	73	34.6
Live with parents	10	4.7
Live with partner	41	19.4
Married	63	29.9
Live with family	8	3.8
Divorced	16	7.6
Family income ($)		
0 to 10,000	25	11.8
10,001 to 20,000	37	17.5
20,001 to 30,000	36	17.1
30,001 to 40,000	29	13.7
40,001 to 50,000	24	11.4
Over 50,000	60	28.4
Number of dependent children[a]		
0	127	60.2
1	33	15.6
2	22	10.4
3	20	9.5
4	6	2.8
5	2	0.9

Table 3 (continued)

Item	*n*	%
Ethnic/racial background		
White(non-Hispanic)	82	38.9
Hispanic	59	28.0
Black	19	9.0
Native American	3	1.4
Asian	28	13.3
Pacific Islander	10	4.7
Other	11	4.7
Number hours paid employment		
0	65	30.8
1-10	15	8.5
11-20	53	25.1
21-30	50	23.7
31-40	25	11.8

[a] 1 student did not respond. $n = 210$.

0.9% five or more children. One hundred twenty-seven students (60.2%) reported no dependent children in their home (see Table 3).

These sample demographic responses revealed annual income with a wide variation of monetary resources. Sixty-two (29%) participants claimed less than $20,000 a year income, and 60 (28%) reported annual income above $50,000 (see Table 3). Regarding paid employment work hours outside of nursing college requirements, 25 students (11.8%) worked 31-40 hours, 50 students (23.7%) worked 21-30 hours, 53 students (25.1%) worked 11-20 hours, 15 students (8.5%) worked 1-10 hours, and 65 students (30.8%) worked zero (0) hours (see Table 3). Care hours for dependent adults as a demographic description was added to this study in light of the aging nursing student. The responsibility for aging immediate family with assistance needs that might be present in or near the home may account for demands on nursing students time and energy (Arenson, 1997). Twenty-nine percent of this sample described devoting some of their hours per week to care hours for "adult dependents" in their homes. The specific breakdown of that 29% was as follows: 4.3% over 25 hours, 6.2% at 16-25 hours, 5.7% at 6-15 hours, 14.7% at 1-5 hours, and 71 % claiming no hours.

Ninety-two percent of the sample declared the commute to community college and hospital-based clinical sites to be at or below 30 miles in each direction of school-bound trip. Students within this sample 68% (144) claimed that the United States was their birthplace and 32% (67) reported that they were born outside of the United States. The language survey question responses indicated that 75% claimed English as their first and primary use language.

This study was designed with a collection procedure of voluntary sample participants, specifically beginning associate degree nursing students. One goal in this sample construction was to have sufficient numbers to be divided into separate traditional and nontraditional subgroups. Traditional students totaled 34 (16%) and the nontraditional student group totaled 177 (84%). These counts were sufficient in number to allow comparison by independent samples *t*-test analysis. Nontraditional students were operationalized by meeting one of the following criteria: age 26 or older, male, married, having dependent children, employed >20 hours per week, and care of extended family > 8 hours per week. Traditional students were operationalized by meeting none of these criteria; in other words, these students were female, < 26 years of age, not married, no children, paid employment at < 20 hours per week, and care of dependent adults at < 8 hours per week.

Secondary Questions

The four secondary questions are presented in order asked. The findings related to each question are reported and the implications of the results are discussed.

Secondary Question 1

The first secondary question was as follows: To what extent, if any, will RN students' demographic factors relate to first-semester nursing students' academic performance and retention (age, marital status, ethnicity, primary language, country of birth, number of dependent children, annual income, miles commuted, and number hours worked in paid employment weekly, and care hours of elders)?

The use of demographic data in this study has been for the purpose of sample description and development toward a clear picture of this sample student nurse group. The reader is cautioned to avoid overinterpretation while confusing relationships of correlation to actual empirical evidence of these variables for prediction. The diversity within this sample reflected a changing demographic found in the southern/western United States (Lewis et al., 1999). The voluntary sample of nursing freshman was collected at three urban, two suburban, and one rural community college. According to Boylan et al. (1999), the larger cities of the United States are projected to follow a similar demographic plurality over the next 20 years. The sample for this study showed a picture of diversity with a majority of nontraditional nursing candidates evidenced as 84% of this sample (meeting one or more of the operationalized criteria for nontraditional student status).

The male candidates studying nursing within this sample numbered 35 (16%). These demographics of male gender matched findings of California community college statistics documented by Lewis et al. (1999). These authors acknowledged a trend since 1997, seen in California, of admission gender reflecting a shift toward higher numbers of male students seeking the nursing major, with numbers stabilizing at around 16% for the past 4 years. These authors noted that larger percentages of male nursing candidates are a demographic reality for nursing education. Poorer retention of male nursing candidates was evidenced in a report by Lewis et al., with recommendations for some change within educational practices for a predominantly female work group and professorate.

This research study, when analyzed by independent samples *t* tests comparing mean dichotomous outcomes of retained versus nonretained status for students, did not indicate significant differences for males as a subgroup for outcomes at the end of their first semester. The Levene's test reflected that variances were not assumed, $F = 16.276$, *Sig.* = .000, with *t* test for equality of means revealing nonsignificant findings, $t(205) = -1.983$, $p > .05$). A zero was contained within the 95% confidence interval, further indicating that significant difference was not present. Results of independent samples *t* test for male versus female subgroups were repeated for outcomes measures as numeric score and letter grade at the end of first semester, and yielded the variances assumed yet no significant *t* test for equality of means; therefore, the same conclusion was drawn that male and female subgroups showed no significant differences in first-semester outcomes. The subgroups of male versus female were not significantly different for the three measures of outcome used in this study and were considered as one sample for all statistical calculations.

The correlation of the remaining demographic variables by Pearson's *r* to numerical grade outcomes reflected seven categories of significant findings for this sample listed as follows: (a) Student Work Hours: $n = 207$, $r = -.156$; (b) Student Income (Ascending): $n = 207$, $r = .194$; (c) White Non-Hispanic Ethnicity: $n = 211$, $r = .372$, (d) Hispanic Ethnicity: $n = 207$, $r = -.195$; (e) Asian Ethnicity: $n = 207$, $r = -.176$; (f) Student Primary Language: $n = 201$, $r = .249$; and (g) Student Birthplace (United States): $n = 207$, $r = -.251$.

The Spearman Rho (r_s) was correlated for all demographic categories toward the retained/nonretained nursing student outcome at 16/18 weeks. Five categories of demographic data showed significant nonparametric findings as follows: (a) Student Age: $n = 211$, $r_s = -.142$; (b) Number of Children (Ascending): $n = 210$, $r_s = .141$; (c) Student Income (Ascending): $n = 211$, $r_s = .174$; (d) Student Primary Language: $n = 205$, $r_s = -.158$; (e) Student Birthplace (United States): $n = 211$, $r_s = -.194$; (f) White Non-Hispanic Ethnicity: $n = 211$, $r_s = .163$; and (g) Asian Ethnicity: $n = 211$, $r_s = -.145$.

This study has correlational findings similar to the work of Arenson (1997). These variables of demographic correlation were controlled for in linear regression and discriminant analysis calculations. Arenson noted that these research correlations of retention results and demographic characteristics may have an understandable pattern but not an empirical basis of prediction for student outcomes. Arenson as well as Henry (1995) reported that, as student age increases, multiple roles as wife/husband, employee, parent, or caregiver of dependent adults might compete and interfere with student concentration of effort and time toward meeting nursing program expectations. The older learner faces a very physically and emotionally draining requirement on daily time demands (Arenson; Henry). Arenson explained these correlation findings of poorer outcome about the aging/married student, verifying that the time demands of multiple roles and responsibilities in addition to adjustment within clinical setting result in fatigue. Married students with multiple children, jobs, and dependent adult care are overwhelmed in their daily role accomplishment, as compared to a younger student, who may be experiencing fewer encumbrances toward professional development as an RN (Arenson; Henry).

The annual income of students has been addressed within the literature of this study as an important point in retention consideration (Feldman, 1993). This sample reflected a significant relationship in nursing student retention through the first semester of the program when crosstabulated with declared annual income. Nursing students in this study reported annual income which correlated to numeric grade outcome, $N = 207$, Pearson's $r = .194$, $p = .005$ (see Table 4). Income also correlated to dichotomous retained/nonretained status, $N = 211$, $r_s = .174$, $p = .011$ (see Table 5). Sixty-two students claimed annual earnings of less than $20,000. Consideration of these students for additional monetary demands of dependent children revealed that possibly 37 students were at risk to be classified near the federal poverty threshold. Twenty of these 37 students also claimed multiple dependent children. All 37 were crosstabulated for academic outcomes of retained/nonretained status; 31 were retained and 6 were not retained (4 who claimed no children, 2 with children) at the end of their first semester in nursing study.

Tolland (1990) noted that, as annual income increases, there may be additional access to more resources (more reliable transportation/car, increased child care money, fewer work hours), thereby decreasing environmental impact demands and freeing the student to spend more time in nursing study. The results of crosstabulation and chi square were significant, chi square = 6.371, $df = 1$, $p = .012$, with directional measures of ordinal by ordinal retained/nonretained dependent variable of Sommers's d value =

Table 4

Nursing Sample Diversity Variables Correlated to First-Semester Numeric and Dichotomous Outcomes

	Outcomes			
	Numeric grade		Retained/nonretained	
	n	Pearson *r*	*n*	Spearman Rho
English primary language	202	.286**	202	.147*
U.S. birthplace	211	.247**	211	.194**
White (non-Hispanic) ethnicity	211	.372**	211	.163*
Hispanic	207	-.195**	211	- .031
Black	207	-.125	211	.035
Asian	207	-.176*	211	- .145*

$^*p < .05$. $^{**}p < .01$.

Table 5

Independent Variables: Intellective Factors Descriptives

Variable	*n*	Possible score	Mean	*SD*
High school GPA	190	6	3.66	0.99
Math assessment	199	5	2.28	1.19
Math remediation	187	2	1.68	0.47
Reading assessment	202	5	2.14	1.04
Reading remediation	187	2	1.68	0. 47
English speaking remediation	194	2	1.85	0.39
Science GPA	208	4	2.17	0.68
Science times taken	207	4	3.58	0.75
Science index	203	8	6.78	1.19

Note. GPA = grade point average.

.092, t =2.9639(211), asymptotic error = .035, Sig. = .008. Although a significant linear relationship is established, the strength of this relationship is weak, with only 9.2% of the dependent outcome variable explained by the independent variable of student annual income.

Further study is suggested and required over annual income correlated to nursing student retention success. Data for financial scholarship assistance were not sought in this study and would be advised for future analysis to avoid overinterpretation of correlations and crosstabulation findings comparing annual income and student academic achievement and retained/nonretained status. The sample would require random collection to rule out spurious sample error and confounding variable interference before these data are offered as more than a relationship of interest warranting further study. The use of in-depth questionnaires and tighter controls of related income factors are suggested before acting upon this simple correlate relationship of annual income and nursing student outcome.

Lewis et al. (1999) noted that California, although admitting a more representative demographic to nursing programs, did not witness this same demographic successfully completing the nursing program and often, if completed, was not followed by RN licensure. This study reflected 82 (39%) of the students claiming White Non-Hispanic ethnicity. Non-White ethnicity was self-reported as 129 (61% of the sample). The non-White ethnic group had 29 (23%) students nonretained at week 16/18 of the nursing program; the White student group had 8 (10%) nonretained at this same quarter mark of the nursing program.

The significant discrepancies in outcomes as documented by Lewis et al. (1999) concerning diversity are repeated here with this sample both to academic achievement measured as numeric grades and dichotomous retained/nonretained outcomes. This study showed significant findings correlating poorer student outcomes over variables of ethnicity (Hispanic and Asian), birthplace outside of the United States, and primary language other than English results measured at the one quarter mark within the nursing program (see Table 6).

Table 6

Correlations: Nursing Student Outcomes at Week 16/18 to Intellective Variables

	Outcome			
	Numeric grade		Retained/nonretained	
Variable	*n*	Pearson *r*	*n*	Spearman Rho
High school GPA	188	.187*	190	.220**
Math assessment	196	.190**	199	.077
Math remediation	183	.193**	187	.156*
Reading assessment	198	.164*	202	.114
Reading remediation	183	.193**	187	.156*
English speaking remediation	191	.171**	194	.256*
Science GPA	204	.358**	208	.186**
Science times taken	203	.409**	207	.276**
Science index	199	.469**	203	.287**

Note. GPA = grade point average

$^{*}p < .05$. $^{**}p < .01$.

Watkins (1997) noted that the student who lacks fluency in primary English might encounter hurdles in the study of nursing science, assertive problem-solving processes, and clinical procedures. These barriers of language, according to Watkins, may increase communication barriers for the learner and instructor. Arenson (1997) and Williams (1994) noted that, as nursing student ethnicity becomes increasingly pluralistic, the rigid learning climate of medical and nursing culture, dominated by White males and females, might offer the student of diversity many hidden challenges. Nursing students may encounter increased difficulty with role-modeling identification and differences in their culture of origin with a subtle but real hindrance to their learning and educational adjustment processes, particularly within the hospital (Williams).

The empirical use of demographic characteristics toward statistical analysis by linear regression required more capacity within the questionnaires of this study to gain accuracy in financial assets, prior health care experience, complex living arrangements, and supportive significant others within the student's community. In addition, sample error must be avoided by random selection of subjects, which is not present in this study. In summary, in a descriptive light a correlational relationship of both academic achievement by numeric grade and dichotomous retention showed some significance with select demographic variables in the voluntary sample within these six nursing programs. Academic achievement by numeric grade was significant when correlated by Pearson's *r* to annual income, primary language (English), birthplace (United States), and ethnicity (White) and negatively correlated to the increasing number of job hours and number of dependent children, and ethnicity Hispanic or Asian. The dichotomous variable of retained/nonretained status by r_s was positively correlated as significant for the variables of increasing annual income, primary language (English), birthplace (United States), and ethnicity White Non-Hispanic. There was significant negative relationship by r_s for academic achievement in the nursing program with increasing number of dependent children and Asian ethnicity. The remaining demographic variables did not show significant correlation to academic achievement or retained/nonretained student status.

Student demographics toward correlation and crosstabulation for numeric grade or retention status were calculated and demonstrated for the reader to gain a profile of this sample and are cautioned to avoid overinterpretation and/or use of these findings as evidence of prediction. There was no effort by this researcher for random sample construction. Although some control of highly correlated demographic variables occurred in linear and discriminant analyses, the voluntary student involvement and selection factor from each of the six schools limits empirical stability of study findings. Exploration of confounding and intervening factors that may hamper accurate interpretation of correlations such as financial assistance, prior healthcare work experience, or prior education in other related healthcare fields of study were not included as data within this sample. In addition, student demographic characteristics cannot as a matter of course be altered, changed, or used as a point of discrimination as selection criteria for most community college nursing program admission requirements. Further study is advised over the demographic characteristics of ethnicity, ESL, birthplace outside of the United

States, and nursing student outcomes for the purpose of exploring acculturation issues and improving student retention.

Secondary Question 2

The second secondary question was as follows: To what extent, if any, will RN student intellective characteristics of prior science course GPA, HSGPA, reading/English, and math assessment test results, and advisement and remediation compliance relate to first-semester nursing students' academic performance and retention?

Academic performance: Numeric grade. Descriptives and correlations were calculated to determine whether a relationship existed from student reported intellective variables, toward the nursing student outcomes at the end of first semester by measuring student numeric grade, letter grade, and retention/nonretention status. The students' reported intellective variables by forced choices for this study included HSGPA, Anatomy and Physiology (A&P) GPA, number of times that Anatomy and Physiology courses were taken to attain grade point average (Science Times Taken), Math Assessment, English/Reading Assessment, Math remediation, English Speaking remediation, and Reading remediation. An overall variable of Science Index was calculated and a more accurate indication of student effort and science aptitude was gained. The Science Index was determined by adding an assigned ascending value for A&P GPA and assigned descending value for the number of times the student repeated the Anatomy and Physiology course to attain this average. These variables were added together and averaging the two created the variable of Science Index. The descriptives and correlations can be found in Tables 7 and 8.

The intellective variables correlated by Pearson's *r* to the continuous variable of numeric grade at week 16/18 reflected that all nine had significant relationships. The average of two intellective variables of Science GPA and Science Times Taken created a relevant and more accurate picture of science aptitude, which showed a progressively more significant finding of relationship to student numerical grade outcomes, $n = 199$, $r = .469$, $p = .000$. HSGPA was correlated, $n = 188$, $r = .187$, $p = .010$. The speaking remediation correlation was correlated to numerical outcomes, $n = 191$, $r = .171$, $p = .018$ (see Table 6). Correlation values of intellective variables were strong and were chosen as the first block of independent variables entered in a forward approach for linear regression analysis toward a prediction equation for numeric grade outcomes.

Academic Performance: Dichotomous Retained Versus Nonretained Grade Correlation values of intellective variables were analyzed toward outcomes classifying students by retained and nonretained status at the completion of first semester of nursing study. Students' self-reported their intellective variables (as described above). The intellective variables, when correlated by r_s to the dichotomous variable of retained/ nonretained status at week 16/18, reflected the following significant relationships: (a) HSGPA: $n = 190$, $r_s = .220$; (b) Math Remediation: $n = 187$, $r_s = .156$; (c) Reading Remediation: $n = 187$, $r_s = .156$; (d) English Speaking Remediation: $n = 211$, $r_s = .256$; (e) Science GPA: $n = 208$, $r_s = .186$; and (f) Science Times Taken: $n = 207$, $r_s = .276$.

Table 7

Independent Variables: Environmental Impact Variables Descriptives (*N* = 211)

SPA of maximum environmental variables	Possible score	Mean	*SD*
AVST toward passing	60	50.60	8.09
EVST toward passing	66	37.10	7.85
Average of AVST + EVST pass	6	4.17	0.65
AVST toward "B" grade	60	49.78	8.14
EVST toward "B" grade	66	36.54	7.35
Average of AVST + EVST "B"	6	4.11	0.64
Overall average of SPA environmental impact	6	4.14	0.61

Note. SPA = Student Perceptual Appraisal; AVST = academic variable strength; EVST = environmental variable strength.

Table 8

Correlations: Student Outcomes at Week 16/18 to Environmental Impact Variables

	Outcomes	
SPA of environmental impact variables	Numeric grade Pearson r^a	Retained/nonretained Spearman Rho[b]
AVST toward passing		.024
EVST toward passing		.042
Average of AVST + EVST pass		.029
AVST toward "B" grade	-.094	
EVST toward "B" grade	-.088	
Average of AVST + EVST "B"	-.105	
Overall average of SPA environmental impact	-.105	

Note. Correlations parametric and nonparametric = no significant linear correlational findings. SPA = Student Perceptual Appraisal; AVST = academic variable strength; EVST = environmental variable strength.

[a] *n* = 207. [b] *n* = 211.

The average of two intellective variables of greatest significance continued to be Science GPA and Science Times Taken, combined as the variable of Science Index, $n = 203$, $r = .287$, $p = .000$. The two intellective variables of Reading Assessment ($n = 202$, $r = .114$) and Math Assessment ($n = 199$, $r = .077$) did not reflect correlation significance to numerical grade outcomes at week 16/18 of the semester for the minimum $p < .05$ values. Speaking, reading, and math remediation did reflect significant findings at $p < .05$ (see Table 6). Correlation values of intellective variables were strong and were chosen as the first independent variables entered in a discriminant analysis and classification grouping.

The study design and conceptual framework sought to theoretically create an encompassing embodiment of student characteristics as a foundation toward nursing student retention. The intellective variables, often seen as a barrier to entrance for nursing candidates, could not be statistically denied as the most salient predictor of outcome with this nursing sample. Correlation values of intellective variables were strong, with the Science Index ($r = .489$) outpacing all variables of the study. The intellective variables were significant in their correlation to numeric outcomes and were chosen as the variables in a linear regression analysis toward a prediction equation of numeric grade outcomes. Also, the variables of remediation of English speaking and Science Index correlated by r_s highly to dichotomous outcomes and were utilized in discriminant analysis.

This researcher cautions the reader not to overinterpret these simple correlations as empirical findings used as an admission barrier for nursing student entrance. The present shortage of RNs does not grant academia the privilege of being exclusive or unduly selective in the choice of candidates (Lewis et al., 1999). These students often present with sincere desire and aptitude to accomplish a healthcare career. According to Abriam-Yago et al. (1999), these intellective variables, particularly English speaking fluency, may be yielding to the use of cohort formation for developmental studies and remediation efforts in pre-nursing study. Abdur-Rahman and Gaines (1999) noted that students reflecting lesser scores in science aptitude, reading, and math ability attained retention survival through the first semester of a nursing program when assisted to develop the academic aptitudes. Their academic variables cited in this 1999 study were similar to the intellective variables of this research. These students often wait after completion of prerequisite courses a full one to two semesters before entrance into nursing programs. These assessed intellective correlates could be remediated within this time frame for the nursing candidate awaiting enrollment. Implications for these findings are offered by this researcher not as an overinterpreted barrier but as an indication to enroll the prenursing student in a developmental studies nursing program cohort as a retention success strategy and study retention impact.

Secondary Question 3

The third secondary question was as follows: To what extent, if any, will RN student's appraisal of environmental impact factors relate to first semester academic achievement and/or retention?

The students completed their perception of select nontraditional college student variables of personal environmental impact (academic ability dynamics, life commitment obstacles, background-defining factors: Bean & Metzner, 1985). The environmental impact scales were rated over a 6-point Likert scale ranging from *Does not apply* to *Greatly supports* in the SPA. The student completed this scale twice: once toward an accomplishment of a B grade and next toward a minimum "pass" grade. The SPA is a combination of 11 questions indicative of the student's appraisal of ability in the face of environmental impact variables (the EVST subscale) and 10 questions indicative of appraisal of ability in the face of academic capacities the (AVST subscale).

The two 21-item scales have a minimum score of 1 and maximum score of 6; they were calculated separately and averaged for a total SPA score. The separation of AVST and EVST scores was done as a subscale per each SPA of B grade and "pass" grade. Each of the 10 academic student appraisal scores and 11 environmental student appraisal scores can be added to obtain a total range of 10 to 60 on AVST and 10 to 66 on EVST. Descriptive means and standard deviations can be found in Table 7. The correlations of all environmental impact variables yielded no significant correlation at $p < .05$ toward academic numeric grade, academic letter grade, or retention/nonretention status (see Tables 7 and 8).

There were significant intercorrelations occurring between AVST and EVST environmental impact scales and toward the self-efficacy subscales. The findings of no significant linear relationship toward nursing student outcomes over the environmental impact instrument differed from the Jeffreys study (1993, 1998) of a similar sample of

87 associate degree nursing students. This study of New York associate degree nursing students reflected that the AVST subscale was a significant correlate to student outcome. These environmental impact variables were entered into linear regression analysis as the third block of independent variables.

Secondary Question 4

The fourth secondary question was as follows: To what extent, if any, will RN students' self-efficacy strength test score over first semester nursing competencies relate to first semester academic achievement and/or retention?

The variable of self-efficacy as perceived by the student over the eight vectors of freshman nursing was elicited for this sample of 211 students. The tool used was created by Jeffreys: the SEST with subscales for nursing skills (NSS) and educational requirements (ERS). These tools reflected the competencies expected to occur over the first semester within the nursing program.

The dimensions of specific fundamental nursing course content were defined though the NSS. The categorization of nursing skills as the eight vectors of freshman nursing was done under the following eight clinical behavioral headings: (a) communication, (b) technical skills, (c) physical assessment, (d) medications, (e) teaching, (f) collaboration, (g) documentation, (h) professional development. The NSS allowed the student to self-appraise these eight vectors over a 6-point scale ranging from *a little confident* to *absolutely certain*.

The ERS is a 10-point pole scale that focused on the degree of confidence in achieving selected academic tasks. Students were asked to rate what they believed was their confidence level (despite any obstacle/hardship) concerning ability to expend whatever amount of energy and time toward accomplishment of tasks of freshman nursing. Tasks include successful attendance at class/clinical/lab, written and computer assignments, reading and study time, and testing grade performance (Jeffreys, 1998). Descriptives over these self-efficacy independent variables can be found in Table 9.

Table 9

Independent Variable: Self-Efficacy Variables Descriptives (*N* = 211)

Self-efficacy variable	Mean	*SD*
Communication	3.98	1.14
Technical skill	4.28	1.18
Physical assessment	4.34	1.05
Medication administration	4.10	1.28
Patient teaching	4.25	1.19
Collaboration skill	4.18	1.30
Documentation	4.47	1.19
Professional development	4.31	1.26
Nursing scale average	4.24	1.04
Educational Requirements average	5.02	0.79
Self-Efficacy Strength Test average	4.63	0.73

Note. Maximum possible score = 6.

Scores were grouped at the higher end of the 6-point scale, showing averages over subscales as follows: Communication = 3.98, Technical Skill = 4.28, Physical

Assessment = 4.34, Medication Administration = 4.10, Patient Teaching = 4.25, Collaboration Skill = 4.18, Documentation = 4.47, Professional Development = 4.31, and Educational Requirements Average = 5.02. The overall SEST average was 4.63, and offered no significant linear correlation by Pearson's r to student outcomes. The correlations of self-efficacy variables reflected no significant correlation at $p < .05$ when Pearson's r was calculated toward academic numeric grade or r_s was calculated toward the dichotomous dependent variable of retention/nonretention status (see Table 10).

Table 10

Correlations: Nursing Student Outcomes at Week 16/18 to Self-Efficacy Variables

	Outcomes	
Variable	Numeric grade Pearson r[a]	Retained/nonretained Spearman Rho[b]
Communication	-.076	-.041
Technical skill	-.099	.036
Physical assessment	-.060	.072
Medication administration	.049	.091
Patient teaching	-.050	.025
Collaboration skill	-.105	-.015
Documentation	-.132	.050
Professional development	-.103	.016
Nursing scale average	-.082	.041
Educational Requirements average	-.089	-.050
Self-Efficacy Strength Test average	-.106	.012

[a] $n = 207$. [b] $n = 211$.

There were significant intercorrelations between the NSS and ERS subscales. Jeffreys (1993, 1998) found similar results for self-efficacy as measured by the NSS and ERS in a study of a similar sample of 87 associate degree nursing students. Jeffreys suggested use of only one of the two self-efficacy subscales to reduce student fatigue in answering questions. These self-efficacy variables were included in linear regression analysis as the final block of independent variables by forward entry.

Primary Questions

The six primary questions are presented in order. The findings related to each question are reported and the implications of the results are discussed.

Primary Question 1

The first primary question was as follows: Is academic achievement of first-semester nursing students related to their intellective characteristics, appraisal of environmental impact, and perceived self-efficacy score?

The correlations of self-efficacy variables reflected no significant correlation at $p < .05$ toward academic numeric grade, academic letter grade, or retention/nonretention status (see Table 10). The correlations of all environmental impact variables yielded no significant correlation at $p < .05$ toward academic numeric grade, academic letter grade, or retention/nonretention status (see Table 8).

The intellective variables, when correlated by Pearson's r to the continuous variable of numeric grade at week 16/18, reflected eight of nine possible significant relationships: (a) HSGPA, n =188, r = .187 $p < .05$; (b) Math Assessment, n = 196, r =

.190, $p < .05$; (c) Reading Assessment, $n = 198$, $r = .164$, $p < .05$; (d) Math Remediation, $n = 183$, $r = .193$, $p < .01$; (e) Reading Remediation, $n = 183$, $r = .193$, $p < .01$; (f) English Speaking Remediation, $n = 191$, $r = .171$, $p < .05$; (g) Science GPA, $n = 204$, $r = .358$, $p < .01$; and (h) Science Times Taken, $n = 203$, $r = .409$, $p < .01$. The average of two intellective variables of Science GPA and Science Times Taken created a relevant and more accurate picture of science aptitude, which showed a progressively more significant finding of relationship to student numerical grade outcomes, $n = 199$, $r = .469$, $p < .01$ (see Table 6).

The intellective variables, when correlated by r_s to the dichotomous variable of retained/nonretained status at week 16/18, reflected the following significant relationships: (a) HSGPA, $n = 190$, $r = .220$, $p < .01$; (b) Math Remediation, $n = 187$, $r = .156$, $p < .05$; (c) Reading Remediation, $n = 187$, $r = .156$, $p < .05$; (d) English Speaking Remediation, $n = 194$, $r = .256$, $p < .05$; (e) Science GPA, $n = 208$, $r = .186$, $p < .01$; and (f) Science Times Taken, $n = 207$, $r = .276$, $p < .01$.

The average of two intellective variables of greatest significance continued to be Science GPA and Science Times Taken, labeled as the variable Science Index. This composite variable of science index continued a significant finding of relationship to student numerical grade outcomes, $n = 203$, $r = .287$, $p < .01$. The two intellective variables of Reading Assessment ($n = 202$, $r = .114$) and Math Assessment ($n = 199$, $r = .077$) did not reflect correlation significance to numerical grade outcomes at week 16/18 of the semester for the minimum $p < .05$ values. In summary, the intellective variables in both parametric correlation to student numeric grade and nonparametric correlation to student retained/nonretained status show significant relationships (see Table 6).

Primary Question 2

The second primary question was as follows: If a significant prediction relationship is established, what independent variables form the best prediction equation for first semester of RN nursing students academic achievement and their student intellective characteristics, environmental impact characteristics, and self-efficacy perceptual score?

Multiple-regression analysis toward academic achievement outcomes.

The four categories of independent variables (demographic characteristics, Intellective Inventory, Self-Efficacy Student Appraisal Scores, and Environmental Impact Student Appraisal Scores) were correlated toward student outcomes. Numerical grade regressed upon several independents explained 32% of variance by a forward entry, with the final model containing variables of science index (A&P GPA and the number of times that student repeated science course), English Fluency, Ethnicity (Caucasian), and self-efficacy educational requirements score.

The model summary in Table 11 represents both the retained independent variables and an explanation of variance for the dependent variable of numerical student grade at the end of the first semester in the nursing program. The coefficient results of linear regression showed Science Index as the highest t value (t =5.393, p =. 000). The three additional variables included in the regression equation were Remediation English

Table 11

Independent Variable Model Summary: Predicting Variance of Student Nurse Numerical Grade Outcomes

					Change statistics	
Model	*R*	R^2	Adjusted R^2	*SE* of estimate	R^2 change	Sig. *F* change
1	.467[a]	.218	.214	6.7364	.218	.000
2	.495[b]	.245	.235	6.6421	.026	.019
3	.548[c]	.300	.287	6.4145	.055	.001
4	.568[d]	.323	.306	6.3293	.023	.023

[a] Predictor (constant): Science Index. [b] Predictors (constant): Science Index. English Fluency. [c] Predictors (constant): Science Index. English Fluency. Ethnicity Caucasian. [d] Predictors (constant): Science Index. English Fluency. Ethnicity Caucasian. Educational Requirement Student Score Appraising Self-Efficacy.

Speaking (t = 1.861, p =. 065), Ethnicity White (t =3.392, p = .001), and Self-Efficacy Educational Requirements student appraisal (t = -2.304, p = .023), respectively. Further results of regression unstandardized and standardized coefficients can be found within Table 12.

Table 12

Summary of Regression Analysis for Intellective Variables Predicting Student Nurses' Outcomes at 16/18 Weeks (N = 146)

Variable	*B*	*SE B*	*β*
Constant	68.536	4.416	
Science Index	2.759	.452	.427
Reading assessment	1.461	.545	.187
Birth place	3.330	1.169	.171
Self-efficacy Education Requirements Subscale	-1.906	.702	-.192

Discriminant analysis. What independent variables form the best classification/prediction for first semester of RN nursing students toward group classification of retained /non-retained status as derived from their student intellective characteristics, environmental impact characteristics and self-efficacy perceptual score? Variables of demographics, intellectives, self-efficacy, and environmental impact were calculated by a discriminant analysis with stepwise entry. Three intellective variables were retained in the analysis toward the dichotomous outcome of retained/nonretained status. The variable of English remediation connoted the most significant canonical discriminant function, associating English fluency and its relevance for a retained group classification at the end of first semester of the nursing program. The variable of English remediation was operationalized from students' reports of their remediation compliance and assigned a point value of 0 if they had chosen not to remediate, 1 if they had followed remediation when counselors had advised them to do so, and 2 if they did not receive assessment results or advisement indicating the need for remediation in English speaking.

The outcomes of retained versus nonretained group membership are the true outcome results of greatest interest to Associate degree programs of nursing when considering students' admission characteristics. To this end of nonparametric two-group classification (retained versus nonretained), a discriminant analysis was calculated for the entire sample of 211 students and all study variables were calculated by stepwise entry into the analysis. The cut-off score for group definition was nonretained $\leq$ 74.44 and retained $\geq$ 74.45, establishing group classification status at the 16/18 week of the nursing program.

The tested eigenvalues established a ratio of between-groups sum and within-groups sum or error of squares = .202. The canonical correlation reflected 41.0% of the variance explained. The canonical discriminant functions showed English fluency as a value of .431, Science Index at .644, and HSGPA at .501 (Table 13). Fisher's linear discriminant functions can be seen in Table 14. The Wilks Lambda = 79.8%, chi square = 31.672, $df = 3$, $p = .000$.

Canonical correlation represents a Pearson-like correlation from intellective variable scores toward group assignment of retention or nonretention. The canonical

Table 13

Standardized Canonical Discriminant Function Coefficients: Intellective Variables

Intellective variable	Function 1
Science index = science times taken + anatomy and physiology grade point average (A&P GPA)	.644
Remediation English speaking	.431
High school grade point average (HSGPA)	.501

Table 14

Fisher's Linear Discriminant Functions for Intellective Variables

	Recode of outcomes 16/18 weeks[a]	
Intellective variable	Nonretained	Retained
Science Index = science times taken + anatomy and physiology grade point average (A&P GPA)	3.498	4.193
Remediation English speaking	10.764	12.165
High school grade point average (HSGPA)	2.854	3.493
Constant	-23.494	-32.296

[a] 0 = nonretained, 1 = retained.

correlation of 41.0% was substantiated by a statistical analysis of linear regression utilizing stepwise entry. The variables included within this linear regression by forward entry were Science Index, English Speaking Remediation, and HSGPA. This model summary supported the canonical correlation of 41.0% but retained only the Science Index variable. Linear regression toward retained/nonretained categorization produced similar results to discriminant analysis, $r = .482$, $r^2 = .232$, r^2 change = .228, F change = 49.959, $df1 = 1$, $df2 = 165$, with Sig. F Change = .000.

Overall, classification rate was 77.5 % of original group cases, as shown in Table 15. A crossvalidation of cases was done only from the cases within this analysis. The linear analysis model reflected an r correlation of 46.8%, which is comparable to the canonical correlation of 41% found within the predictive discriminant analysis.

Further study of the English speaking variable is advised by this researcher, with firmer controls on type of English assessment testing, established reliable cut score to direct counselor advisement, and follow-up of students to access a planned remediation course. These findings of remediation in English speaking were similar to the research of Abriam-Yago et al. (1999). Their use of the Cummins Model as a framework for teaching nursing students for whom English is a second language yielded improved outcomes. The future use of the findings of this study may allude to English language fluency testing with remediation accomplishment before the start of the nursing program followed by outcomes evaluation of nursing student retention.

In summary, the discriminant analysis results of these six intellective variables acting as predictive independents yielded an $r = 44.9\%$ canonical correlation. A linear

Table 15

Classification Results of Nursing Student Outcomes: Predictive Discriminant Analysis

Result	Outcomes 16/18 weeks[a]	Nonretained	Retained	Total
Original				
Count	Nonretained	17	10	27
	Retained	28	114	142
%	Nonretained	63.0	37.0	100.0
	Retained	19.7	80.3	100.0
Crossvalidated[b]				
Count	Nonretained	17	10	27
	Retained	29	113	142
%	Nonretained	63.0	37.0	100.0
	Retained	20.4	79.6	100.0

Note. Cross validation results = 77.5% of original grouped cases correctly classified. 76.9% of crossvalidated grouped cases correctly classified.

[a] 0 = nonretained, 1 = retained. [b] Crossvalidation is done only for those cases in the analysis. In crossvalidation, each case is classified by the functions derived from all cases other than that case.

regression model using these same independents toward a dummy coding of the dichotomous variable of retained/nonretained again showed a similar $r = .485$, r^2 and r^2 square change = .235, F change = 8.310, $df1 = 6$, $df2 = 162$, with Sig. F Change = .000. A predictive discriminant analysis toward outcome group classification of students into their retained and nonretained status yielded 78% accuracy to the $p < .000$ level of significance beyond chance.

Primary Questions 3 and 4

The third primary question was as follows: If the above model is found to significantly predict RN student achievement within the combined traditional/nontraditional sample, what is the best prediction equation for traditional first-semester RN students' academic achievement and their student intellective characteristics, environmental impact characteristics, and self-efficacy perceptual score?

The fourth primary question was as follows: If the above model is found to significantly predict RN student achievement within the combined traditional/nontraditional sample, what are the best prediction equation for nontraditional first-semester RN students between academic achievements and their student intellective characteristics, environmental impact characteristics, and self-efficacy perceptual score? These questions were answered via analysis using independent variable t tests of differences between traditional versus nontraditional student subgroups.

An independent samples t test was completed on the sample of 211 freshman nursing students to answer the question of whether the mean values of traditional versus nontraditional nursing students differed over their independent variable scores of self-efficacy appraisal, environmental impact perception, and intellective characteristics. The purpose of this comparison of means was to consider whether these two subgroups of traditional and nontraditional students would be treated as two separate groups in regression equations and discriminant analysis toward prediction of student outcomes at week 16/18 of the semester.

The independent samples *t* test comparing the means of traditional versus non-traditional students for the independent variables of demographics, intellective, environmental, and academic impact, and self-efficacy variable categorizations were analyzed. As would be expected, significant differences were seen in the demographic variables defining student status as traditional versus nontraditional (age, marital status, hours worked); therefore, these variables are not considered as relevant in this *t*-test analysis. The variables showing significant differences were: (a) EVST toward pass grade, $f = 2.089$, $p = .150$, $t = 2.547$, $df = 209$, $p = .012$; (b) AVST toward pass grade, $f = .375$, $p = .541$, $t = 2.355$, $df = 209$, $p = .019$; (c) Hispanic Ethnicity, $f = 9.758$, $p = .002$, $t = 2.266$, $df = 43.076$, $p = .013$; (d) Black Ethnicity, $f = 25.969$, $p = .000$, $t = -4.998$, $df = 176.000$, $p = .000$.

The null hypothesis that traditional and nontraditional students would not differ in their environmental impact and academic impact variables as perceived by student self-appraisal scores was rejected. The variables of significant difference (EVST pass, AVST pass, Hispanic ethnicity, Black ethnicity), when entered for linear regression, were not retained variables toward final model formation. The three measures of outcome (dichotomous retained/nonretained status, letter grade, and numeric grade) and model components of intellective variables and self-efficacy variables were not significantly different when analyzed by independent samples *t* test.

The remaining independent and outcomes variables showed a *p* value > .05 and contained a zero at the 95% confidence level within the upper and lower interval of *t* test for equality of means. The null hypothesis was accepted that these variables would not significantly differ in score when the two subgroups of traditional and nontraditional student mean scores were broken out of the original sample of 211 students and compared. Therefore, these two subgroups of traditional and nontraditional nursing students were considered as having no significant differences in their means over these self-efficacy and intellective variables.

The linear regression of all independent variables was repeated with the subgroup of nontraditional students ($n = 124$). Variables retained in the equation for nontraditional students were Science Index, HSGPA, and Remediation of English Speech and Self-Efficacy Educational Requirements scale. The following calculation indicated the best regression equation for predicting nursing student outcomes from the subgroup of nontraditional student status from independent variables in their first semester of the nursing program: Y'_z = (.427)(Z score Science Index) + (.193)(Z score High School GPA) + (.163)(Z score remediation of HSGPA) + (-.155)(Z score Self-Efficacy ERS) (see Table 16). This equation is best displayed in standardized Z score format due to the differences in scale for measures and student scores.

Table 16

Summary of Regression Analysis for Intellective Variables Predicting Student Nurses' Outcomes at 16/18 Weeks (*N* = 124)

Variable	*B*	*SE B*	*β*
Constant	59.007	5.866	
Science Index	2.790	.510	.427
High school grade point average	1.461	.576	.193
Remediation English speech	3.746	1.755	.163
Self-efficacy Education Requirements Subscale	-1.537	.747	-.155

The linear regression analysis of all independent variables was repeated with subgroups of traditional students (*n* = 30). Variables retained in the equation for traditional students were Science Index and Birth Place. The following calculation indicated the best regression equation for predicting nursing student outcomes from the subgroup of traditional student status from independent variables in their first semester of the nursing program: $Y'_{/} = (.448)(Z \text{ score Science Index}) + (.507)(Z \text{ score Birth Place})$ (see Table 17). This equation is best displayed in standardized Z score format due to the differences in scale for measures and student scores.

Table 17

Summary of Regression Analysis for Intellective Variables Predicting Student Nurses' Outcomes at 16/18 Weeks (*N* = 30)

Variable	*B*	*SE B*	β
Constant	58.536	5.671	
Science Index	2.779	.872	.427
Birth place	8.027	2.225	.507

Although the four independent variables (EVST pass, AVST pass, Ethnicity Hispanic, and Ethnicity Asian) reflected a significant difference on independent *t* tests for traditional and nontraditional subgroups, these variables were excluded in all regression and discriminant calculations when entered with other independents for the sample when treated as a whole or as subgroups. The independent variables that remained included in linear regression models for traditional and nontraditional student subgroups showed differences when forward entry was used. The inclusion and exclusion of different independent variables and their beta weights are displayed in Tables 15 and 16.

Primary Question 5

The fifth primary question was as follows: Do traditional and nontraditional first-semester nursing student samples differ in academic achievement? If they differ, how do they differ? These questions were answered via analysis using dependent variable *t* tests of differences between traditional versus nontraditional student subgroups. An independent samples *t* test was completed on the sample of 211 freshman nursing students. The question asked whether the mean values of traditional versus nontraditional nursing students differed over their academic achievement as measured by their numeric grade at 16/18 weeks of their first semester within the nursing program. The Levene's Test for equality of means was assumed; however, the *t* test reflected a non-significant finding of $p > .05$ with a zero (0) within the 95% confidence interval. The independent *t*-test results reflected no significance differences, $F = 1.188$, $p = .277$, $t(205) = .901$, $p > .05$. Therefore, these two subgroups of traditional and nontraditional students from this study sample are not subgroups of statistically significantly difference in their academic achievement measured from numeric grade scale (1 to 100) at week 16/18 of their first semester within the nursing program and can be treated as one group for statistical analyses.

Primary Question 6

The sixth primary question was as follows: Do traditional and nontraditional first-semester nursing students differ in retention? If they differ, how do they differ? An independent samples *t* test was done on a sample of 211 freshman nursing students. The question was whether the mean values of traditional versus nontraditional nursing students differed over their retained versus nonretained student status at the end of first semester. The goal of this comparison of means was to consider whether these two subgroups would be treated as separate in discriminant analysis toward prediction of student outcomes at week 16/18 of the semester.

Traditional and nontraditional student statuses were assigned a 0 or 1 value, respectively. The independent *t*-test results with Levene's Test for equality of means were not assumed; however, the *t* test reflects a nonsignificant finding of $p > .05$ with a zero (0) within the 95% confidence interval, $F = 4.330$, $p = .039$, $t(209) = .336$, $p > .05$. Repeating the test by nonparametric Kuskal Wallis test for analysis of variance (ANOVA) of traditional and nontraditional student outcomes as a string value was performed. The traditional and nontraditional student subgroups reflected chi square = .921, $df = 1$, $p = .335$. Kuskal Wallis ANOVA results far exceeded the $p < .05$ levels, indicating no assumed significant difference calculated for nonparametric measures toward outcomes of retained and nonretained outcomes for traditional and nontraditional student subgroups. These further indicate that the subgroups of students defined as traditional and nontraditional were not different in retained/nonretained nursing student status at 16/18weeks and can be treated as one single sample for all nonparametric discriminant analysis.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This descriptive/correlational study examined the relationship of first-semester academic achievement and retention in relation to four categories of select predictor variables for associate degree RN students. Presently, there is a nursing shortage throughout the major population centers of the United States, even while community colleges are graduating fewer RN students (Schriebner, 2000). This health care provider supply-and-demand issue is predicted to worsen as nursing's aging workforce reaches 50% retirement over the next 15 years (Dickenson-Hazard, 2000).

The deficit of RN supply arises due to multiple advances in health care intervention for cancer, diabetes, and cardiac diseases that now yield a longer life span. The public now seeks medical attention for quality-of-life issues that, before this past decade, were the privilege of the wealthy and elite. The requirement for RN workforce has increased due to this client care with respect to life issues of fertility, obesity, and outpatient surgeries, including vision correction.

As clients now survive longer, their safe and effective care with multi-system disease requires state-of-the-art technology as well as the humanistic application of knowledge from biological and social sciences. Recipients of health care maintenance insist on the expertise of a RN for analysis and critical thinking. The RN far outpaces any other category of technician at the bedside, offering comprehensive patient care while applying multi-tasking skills. The university, state college, and community college are the three tiers of higher education that act as the institutions for new RN supply. The principal educational provider of this RN supply exit from higher education through the doors of the community college.

Lopez (1992) wrote that the community college functions as the chief provider of 70% of the RN hospital-based workforce. The community college within the rural areas of the United States is often the sole source for RN education and, therefore, the only regional provider of this essential community worker. Long gone are the nursing schools that were affiliated with hospitals and provided sufficient numbers of RN caregivers in the 1960s. Studies have documented a rate of nonretention between 10% and 40% among RN majors at community colleges in California (Lewis et al., 1999). Additionally, a California statewide study recorded students in the nursing major at the community college level as reflecting high percentages of nonretention. These authors further reported that the diversity of RN graduates falls far short of mirroring the surrounding communities.

Community college mission statements place a high priority on providing a diverse candidate matching local community workforce needs. Successful academic outcome of additional RN candidates is integrally involved with higher education's response to this nursing shortage, specifically the endeavors of the community college.

This composite of interrelated factors formed the necessity for this research. Increasing the number of new RNs entering the workforce pipeline requires retention research in community college nursing programs and initiatives developed from retention study results to aid in correcting this health care provider crisis.

Summary

This study addressed retention issues of the RN candidate with the collection of a sample of 211 freshman students and created a comprehensive picture of student characteristics. The sample members, from six associate degree nursing programs in the western United States, were longitudinally followed for academic achievement and retention through the time of greatest nonretention—their volatile first semester. The sample, collected during the Spring 2001 semester, reflected the following demographic characteristics: 16% male, 67% married, 32% with dependent children, 28% claiming an annual income near the federal poverty threshold, and 84% nontraditional student status. This study's conceptual framework encompassed a broad range of in-depth student characteristics (demographic, intellective, self-efficacy, and environmental impact variables).

Bandura's theory of self-efficacy and Bean and Metzner's constructs of nontraditional student environmental impact were operationalized through tools created by Marianne Jeffreys and tailored to first-semester nursing student concerns. The intellective variables in the study framework were initially conceptualized as of no greater weight or impact in influencing student outcome. This study did not find the variables of self-efficacy and environmental impact to be significant within correlation and prediction calculations in this first-semester RN sample. The intellective variables of science aptitude, reading and math assessment aptitude, and English speaking fluency were the independent variables with the most significant correlational relationship, linear regression, and discriminant analysis prediction. First-semester indicators showed interesting demographic correlates of lower annual income and minority subgroup membership as significant negative relationships to numerical grade achievement and nursing student retention. With respect to the subgroups of Traditional and Nontraditional students, there were no significant differences for outcomes of numerical grade or retention status. Additionally, male versus female students from this sample compared similarly as subgroups for their independent variables of self-efficacy, intellectives, and outcomes.

The most significant correlational relationship was evidenced for the sample as a whole for numerical grade outcomes, when calculated by Pearson *r* for A&P GPA and the number of times the student repeated the course to attain this GPA, measured as a Science Index. Additionally, a significant relationship was evidenced for numerical grade outcome for the intellective variables of HSGPA, Math and Reading and English Assessment, as well as remediation patterns for English speaking fluency. The independent variables' relationships correlated to a two-category grade outcome (retained/nonretained) were evidenced by the Science Index, remediation patterns for English speaking fluency, and HSGPA.

Results from this study examined demographic variable relationships to academic achievement. Higher numerical grades were more likely to occur for those who reported (a) a higher annual income, (b) primary language as English, (c) birth within the United States, (d) nonminority (Caucasian) status, (e) fewer hours of employment, and (f) few dependent children. Much the same picture of demographic correlates came into evidence when outcomes of retained/nonretained status were measured, depicting improved retention for students who reported (a) higher annual income, (b) primary language as English, (c) birth within the United States, and (d) being nonminority (Caucasian).

This researcher regressed grade on several independent variables and was able to explain 30% of variance of this dependent variable of grade. The variables of this regression model were Science Index, English speaking fluency remediation, reading assessment, and student appraisal of self-efficacy toward educational requirements. Using a discriminant analysis to better understand the students who were retained from those who were not, a significant classification rate of 78% (p = .000) was attained. The variables for this prediction model were Science Index, English speaking fluency remediation and HSGPA. Science Index was the sole retained variable in multiple linear regression models and predictive discriminant analyses tested in this sample over first-semester RN candidate outcomes.

In summary, the Science Index, measured by the student's achievement in A&P GPA and science course repetitions, was able to explain a significant amount more variance of academic achievement. Science Index and English speaking fluency remediation were also significant independent variables, yielding a 78% accurate prediction for retained/nonretained student status. The variables of ethnicity, birthplace outside of the United States, and English speaking fluency have an underlying similarity, as well as logical implication of relationship and, in this study, yield significant partial correlation to each other when defining student characteristics. Measurement of non-Caucasian nursing candidates utilizing this set of three diversity variables, grouped as an index in future study, may offer further insight over student outcomes. Conclusions and study implications are aimed toward nursing program stakeholders to recognize intellective variables, particularly A&S GPA and science course repetitions, as a significant prediction of first-semester nursing candidate retention.

Conclusions and Implications of the Study

The following findings of this study are limited to conclusions based upon a comprehensive, yet finite database of student characteristics. This researcher recognizes that the study design took a perspective from a narrowed lens for retention analysis, viewing the nursing student as the focal stakeholder within higher education. Study propositions are addressed to the reality that multiple stakeholders in higher education (college administration, student services counselors, nursing faculty, state regulatory agencies, clinical hospital affiliates, and high school advisors) are all engaged in the provision of a safe and effective workforce of registered nurses. Study findings are organized and applied to the themes of admission criteria, use of voluntary versus mandatory student assessment and remediation policy, as well as further social action research probing exploration of diversity issues.

Admission Criteria to Nursing Major

Science Index should be added to nursing program selection/admission criteria as a predictive student characteristic to assess and advise for pre-nursing program remediation. Science Index is present, at no additional cost, in student academic files prior to nursing candidate admission and, along with English speaking fluency and HSGPA, predicts with 78% accuracy a nursing candidate's retained versus nonretained status. Science GPA and the course repetitions of anatomy and physiology to attain program entrance requirements also explained a significant amount of academic grade through the first semester of the nursing program. Nursing programs that continue to enter candidates with low Science Index can expect poorer student retention outcome. Nursing educational requirements, even in this first semester, necessitate application of anatomy and physiology concepts, critical judgment skills using the scientific process, and a safe and effective fluency command of the English language. This study shows that lower aptitudes in these intellective characteristics jeopardize nursing student retention.

Voluntary Versus Mandatory Student Assessment, Remediation, and Mentoring Policy

Nursing candidates who have low Science Indices, poor English fluency, low reading scores, and/or low HSGPA should be provided with a concise remediation program and be mentored consistently throughout the program. The combination of remediation and mentoring should improve the likelihood of retention.

Policies of voluntary assessment, remediation, and mentoring need to be reconsidered and changed for the basic skills of reading and math. Assessments of basic skills reflecting lowered aptitude in reading and math were correlated to first-semester nursing low grade and nonretention in this study. Voluntary choice assessment policies would initially seem to offer greater access; however, in this study they seemed to inhibit student retention success.

Social Action Initiatives for the RN Workforce

Nursing candidate demographic findings measured within this study and found to be significantly correlated with a greater risk for retention survival through the first semester of the nursing program were the following: (a) lower annual income, (b) job hours over 20 per week, (c) English not the native tongue, (d) birthplace outside of the United States, and (e) ethnicity non-Caucasian.

Acculturation and financial support for student needs seem indicated from significant relationships of retention survival and demographic description. The rigor of the nursing curriculum for students of diversity, lower income, and nearly full-time job requirements would seem to require further in-depth exploration. Institutional goals implying social action and the hope for more diversity in RN personnel require long-term financial commitment for programs of nursing to truly impact the numbers of RN graduates exiting into the workforce.

Specifically, institutions serving the educational needs of nursing candidates with diversity factors (ethnicity non-Caucasian, birthplace outside of the United States, and English not the native tongue of the student) as indicated from this study, require multicultural initiatives with students, nursing faculty, clinical affiliates, and college counselors toward the goal of a diverse RN workforce.

Recommendations for Further Study

The recommendations for further study listed here are focused towards replication research, revised instrument utilization, institution of study implications, and longitudinal follow-up of the nursing candidate throughout the entire RN program and state licensure:

1. Study the impact of Science Index and English speaking fluency remediation for the entire duration of the ADN program by both retrospective and longitudinal design.

2. Study by qualitative research design student diversity factors impacting registered nursing students' outcomes, including all nursing workforce preparation stakeholders.

3. Specifically explore, through discussion with the nursing faculty of this sample, these study findings of predictive intellective characteristics and diversity issues impacting their nursing students' outcomes.

3. Study students of English as a second language, birthplace outside of the United States, and minority ethnicity characteristics for effects of English speaking

remediation. Implement experimental design using (for example) the Cummins model integrated within a nursing curriculum and its impact on academic achievement and retention of students of diversity.

4. Study assessment and advisement practices utilized by high school advisors and counselors with pre-nursing candidates that require/recommend developmental and remediation education compliance—outcome tracking of nursing students whose advised remediation was accomplished prior to nursing program entry, particularly for the independent variables of math, reading and English-speaking skill and A&P science aptitude.

5. Study nonretained students at or near the point of program exit for reasons of program departure from students, faculty, and program director.

6. Study the variable of annual income and job hours using care to include scholarship/financial aide, support from relatives, and community assistance for significant correlations that may be influencing student outcome. Utilize an in-depth questionnaire format and improved control of extraneous variables that impact student outcomes from use of higher education assistance.

6. Replication research of this study may improve validity by direct access to student intellectual characteristics documented within nursing candidates' official records as improved design over student report intellective data. Utilize only the ERS and SPA-Pass only once toward a passing grade as the instruments measuring self-efficacy and environmental impact.

REFERENCES CITED

REFERENCES CITED

Abdur-Rahman, V., & Gaines, C. (1999). Retaining Ethnic Minority Nursing Students (REMINS): A multidimensional approach. *ABNF Journal, 10*(2), 33-36.

Abriam-Yago, K., Yoder, M., & Kataoka-Yahiro, M. (1999). The Cummins Model: A framework for teaching nursing students for whom English is a second language. *Journal of Transcultural Nursing, 10*(2), 143-149.

Arenson, J. H. (1997). A part-time clinical option: Meeting the needs of nontraditional nursing students. *ABNF Journal, 8*(6), 116-119.

Arrington, P. (1996). Retention issues in perspective: Report on the American Association of State Colleges and Universities/Sallie Mae National Retention Project. In C. A. Ford (Ed.), *Student retention success models in higher education* (pp. 361). Tallahassee, FL: CNJ Associates.

Aschar, H., & Skenes, R. (1993). Can Tinto's Student Departure Model be applied to nontraditional students? *Adult Education Quarterly*, 43, 90-100.

Astin, A. W. (1975). *Preventing students from dropping out.* San Francisco: Jossey-Bass.

Astin, A. W. (1993). *What matters in college? Four critical years revisited.* San Francisco: Jossey-Bass.

Astin, A. W. (1996). Involvement in learning revisited: Lessons we have learned. *Journal of College Student Development, 37*, 123-132.

Attinasi, L. C. (1989). Getting in: Mexican Americans' perceptions of university attendance and implications for freshman year persistence. *Journal of Higher Education, 60*, 247-277.

Attinisi, L. C., & Nora, A. (1992). Diverse students and complex issues: A case for multiple research methods in college research. In F. K. Stage (Ed.), *Diverse methods for research and assessment of college students* (pp. 13-27). Washington, DC: American College Personnel Association Press.

Baird, L. L. (1988). The college environment revisited: A review of research and theory. In J. C. Smart (Ed.), *Higher education: Handbook of theory and research* (Vol. 4, pp. 1-52). New York: Agathon Press.

Baird, L. L. (1996). Learning from research on student outcomes. In S. R. Komives, D. B. Woodard, & Associates (Eds.), *Student services: A handbook for the profession* (3rd ed.). San Francisco: Jossey-Bass.

Ballmer, P. L. (1999). The experience of minority basic baccalaureate nursing students in a predominantly European American college (Master's thesis, Medical College of Ohio, Toledo). *Masters Abstracts International, 37-05,* 1432.

Bandura, A. (1991a). Human agency: The rhetoric of and the reality. *American Psychologist, 46,* 157-162.

Bandura, A. (1991b). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decisional Processes, 50,* 248-257.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28,* 117-148.

Bandura, A. (1995). Comments on the crusade against causal efficacy of human thought. *Journal of Behavior Therapy and Experimental Psychiatry, 26,* 179-190.

Bandura, A. (1996). Ontological and epistemological terrains revisited. *Journal of Behavior Therapy and Experimental Psychiatry, 27,* 323-345.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.
Banks, J., & Banks, C. M. (1995). *Handbook of research on multicultural education.* New York: Macmillan.

Bean, J. P. (1980). Dropouts and turnover: The synthesis of a causal model of student attrition. *Research in Higher Education, 12*(2), 155-187.

Bean, J. P., & Metzner, B. S. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55,* 485-540.

Benda, E. J. (1991). The relationship among variables in Tinto's conceptual model and attrition of bachelor's degree nursing students. *Journal of Professional Nursing, 7*(1), 16-24.

Board of Registered Nursing. (2000, Spring). The nursing summit 1999. *The BRN Report, 10.*

Boylan, H., Bonham, B., & Bliss, L. (1994). Who are the developmental students? *Research in Developmental Education, 11*(2), 1-4.

Boylan, H., Bonham, B., Claxton, C., & Bliss, L. (1992). *The state of the art in developmental education: Report of a national study.* Paper presented at the First National Conference on Research and Developmental Education, Charlotte, NC.

Boylan, H., & Saxon, D. P. (1998). *An evaluation of developmental education in Texas colleges and universities.* Austin, TX: Texas Higher Education Coordinating Board.

Boylan, H. R., & Bonham, B. S. (1999). *Improving developmental education: Lessons learned from 30 years of research.* Paper presented at the National Association for Developmental Education Conference, Detroit, February, 1999.

Boylan, H. R., Bonham, B. S., & White, S. R. (1999). Developmental and remedial education in post-secondary education. In G. H. Gaither (Ed.), *Promising practices in recruitment, retention, and remediation* (pp. 87-101). San Francisco: Jossey-Bass.

Brawer, F. B. (1996). Retention-attrition in the nineties (Report No. EDO-JC-96-06). Washington, DC: Office of Educational Research and Improvement. (ERIC Document Reproduction Service No. ED 393 510)

Byrd, G., Garza, C., & Nieswiadomy, R. (1999). Predictors of successful completion of a baccalaureate nursing program. *Nurse Educator, 24*(6), 33-37.

Cabrera, A., Castaneda, M. B., Nora, A., & Hengstler, D. (1992). Convergence of two theories of persistence. *Journal of Higher Education, 63,* 143-164.

Campbell, A. R., & Dickson, C. J. (1996). Predicting student success: A ten-year integrative review and meta analysis. *Journal of Professional Nursing, 12*(1), 47-59.

Casazza, M., & Silverman, S. (1996). *Learning assistance and developmental education.* San Francisco: Jossey-Bass.

Catalano, J. T. (1985). Keeping college students in college: A motivation-retention model. *College Student Journal, 19,* 225-260.

Catalano, J. T., & Eddy, J. P. (1993). Crisis in nursing education. *College Student Affairs Journal, 12*(2), 52-59.

Clark, K. (1995). SELECT: Achieving and rewarding excellence in faculty advising. Coffeyville, KS: Coffeyville Community College. (ERIC Document Reproduction Service No. ED 382 264)

Coleman, I. C. (1993). The success project: A model to increase admission, retention, and graduation of minority students. In J. Simmons (Ed.), *Prospective: Celebrating 40 years of associate degree nursing education* (NLN Publication #23-2517, pp. 17-23). New York: National League of Nursing.

Condon, V. M. M. (1996). *Student-identified factors related to academic success or progress of culturally diverse baccalaureate nursing students.* Unpublished doctoral dissertation, Claremont Graduate School, Claremont, CA.

Crow, K. (1997). Integrating transcultural knowledge into nursing curricula: An American Indian example. In A. Morey & M. Kitano (Eds.), *Multicultural course transformation in higher education* (pp. 211-228). Boston: Allyn & Bacon.

Davis, T. M., & Murrell, P. H. (1993). Turning teaching into learning: The role of student responsibility in the collegiate experience (ASHE-ERIC Higher Education Report No. 8). Washington, DC: George Washington University.

Day, J. C. (1996). *Population projects of the United States by age, sex, race, & Spanish origin, 1995-2050: Current population report No. 1130.* Washington, DC: Bureau of the Census.

Dickenson-Hazard, N. (2000). Facts on the nursing shortage: Sigma Theta Tau International. *Position Paper from the Sigma Theta Tau International Honor Society of Nursing.* July 2000. Available: http://www. nursinghonor.org/media

Dugan, K. J. (1999). Investigation of academic, cognitive, personality and institutional predictors of retention and academic performance of community college students enrolled in general education courses (Doctoral dissertation, University of Nevada, Reno, 1999). *Dissertation Abstracts International, A60/06,* 1919.

Duran, R. P. (1986). Prediction of Hispanics' college achievement. In M. Olivas (Ed.), *Latino college students* (pp. 221-245). New York: Columbia University, Teachers College.

Duran, R. P. (1987). Hispanic's pre-college and undergraduate education: Implications for science and engineering students. In L. S. Dix (Ed.), *Minorities: Their under-representation and career differentials in science and engineering* (pp. 73-128). Washington, DC: National Academy.

Duran, R. P. (1996). Research on college students: Commonality, difference, and direction. In C. Turner, M. Garcia, A. Nora, & L. I. Rendon (Eds.), *Racial and ethnic diversity in higher education* (pp. 567-583). Needham Heights, MA: Simon and Schuster.

Eaton, M. J. (1992). Retention related to self-efficacy in student nurses (Master's thesis, San Jose State University, 1992). *Masters Abstracts International, 31-01*, 0271.

Ehrenfeld, M., Rotenburg, A., Sharon, R., & Bergman, R. (1997). Reasons for student attrition on nursing courses: A study. *Nursing Standard, 11*(23), 34-38.

Feldman, K. A. (1993). Factors associated with one-year retention in community college. *Research in Higher Education, 34*, 503-512.

Fink, D., & Carrasquillo, C. (1994). *Factors associated with one-year retention in the community college.* A paper presented at the sixth Annual International Conference of the Innovation League in the Community College and the Community College Leadership Program, July 17-20, 1994, San Diego. (ERIC Document Reproduction Service No. ED 379 008)

Fitzsimmons, M. L., & Kelley, V. M. (1996). *The culture of learning: Access, retention, and mobility of minority students.* New York: NLN Press.

Fitzsimmons, M. L., & Kelley, V. M. (2000a). Introduction: What TLC taught us. In M. L. Fitzsimmons & V. M. Kelley (Eds.), *Understanding cultural diversity: Culture, curriculum and community in nursing* (pp. 1-8). Sudbury, MA: Jones & Bartlett.

Fitzsimmons, M. L., & Kelley, V. M. (2000b). Of tugboats, transition, and time. In M. L. Fitzsimmons & V. M. Kelley (Eds.), *Understanding cultural diversity: Culture, curriculum and community in nursing* (pp. 349-352). Sudbury, MA: Jones & Bartlett.

French, H. P. (1989). *Educating the nurse practitioner: An assessment of the pre-registration preparation of nurses as an educational experience.* Unpublished doctoral dissertation, University of Durham, Durham, England.

Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research: An introduction* (6th ed.). White Plains, NY: Longman.

Glanville, W. B. (1989). An involvement program to increase retention of remedial pre-nursing students in a clinical nursing program: Implications for public urban community college educators (Doctoral dissertation, Columbia University, Teachers College 1989). *Dissertation Abstracts International, 50-03B,* 0903.

Grow, G. O. (1991). Teaching learners to be self-directed. *Adult Education Quarterly, 41,* 125-149.

Harvey, V., & McMurray, N. (1994). Self-efficacy: A means of identifying problems in nursing education and careers progress. *International Journal of Nursing Studies, 31,* 471-85.

Hayes, E. F. (1998). Mentoring and nurse practitioner student self-efficacy. *Western Journal of Nursing Research, 20,* 521-535.

Henry, V. (1995). Support systems and retention: Perceptions of adults in an associate degree nursing program (Doctoral dissertation, Columbia University, Teachers College). *Dissertation Abstracts International, 56-07A,* 2528.

Herndon, M. S. (1981). A longitudinal study of financial aid persister, dropouts, and stop outs: A discriminant analysis (Doctoral dissertation, University of California, Los Angeles). *Dissertation Abstracts International, 42,* 4736A-4737A.

Hesser, A., Lewis, L., Abbott, B., & Vericella, B. (1993). Evaluation of a supplementary retention program for Black allied health sciences students. *Journal of Allied Health, 22*(2), 175-182.

Ingalls, J. R. (1999). *Associate degree nursing students' and their clinical educators' correlates of perceived decision-making.* (Doctoral dissertation, George Mason University, Accession Number # 1999070432, UMI Order # PUZ8707363)

Isaac, S., & Michael, W. B. (1997). *Handbook in research and evaluation for education and the behavioral sciences* (3rd ed.). San Diego: EdITS/Educational and Industrial Testing Services.

Janes, S. (1993). Factors related to degree completion as perceived by Black graduates of baccalaureate nursing programs (Doctoral dissertation, Florida State University). *Dissertation Abstracts International, 54-02B,* 0729.

Jeffreys, M. R. (1993). The relationship of self-efficacy and select academic variables on environmental variables on academic achievement and retention (Doctoral dissertation, Columbia University, Teachers College, 1993). *Dissertation Abstracts International, 54-08B,* 4079-00188.

Jeffreys, M. R. (1998). Predicting nontraditional student retention and academic achievement. *Nurse Educator, 23*(1), 42-48.

Jeffreys, M. R., & Smodlaka, I. (1999). Construct validation of a transcultural self-efficacy tool. *Journal of Nursing Education, 38*, 222-227.

Jenson, K., Banwart, L., Venhaus, R., & Popkess-Vawter, S. (1993). Advanced rehabilitative nursing care of coronary angioplasty patients using self-efficacy theory. *Advanced Nursing, 18*, 926-931.

Jones, B. A. (1992). Inductive development of a theoretical model to predict retention of Puerto Rican students enrolled in nursing education programs (Doctoral dissertation, Widener University School of Nursing). *Dissertation Abstracts International, 53-12B*, 6222.

Jourden, F. J. (1991). *The influence of feedback framing on the self-regulatory mechanisms governing complex decision making.* Unpublished doctoral dissertation, Stanford University, Stanford, CA.

Klisch, M. L. (2000). Retention strategies for ESL nursing students. *Journal of Multicultural Nursing & Health, 6*(1), 21-28.

Leovy, S. (1999, November 23). Nursing student attrition increases in Orange County community colleges. *Los Angeles Times*, p. A1.

Lettus, M. K. (1990). *A study of the relationship of learning, motivation and social supports to completion and withdrawal from a nontraditional assessment program in baccalaureate nursing.* Unpublished doctoral dissertation, State University of New York at Albany.

Lewis, E., Sechrist, K., & Rutledge, D. N. (1999). Data collection for nursing workforce: Strategic planning in California. *Journal of Nursing Administration, 29*(5), 9-11.

Lockie, N. M., & Burke, L. J. (1999). Research briefs: Partnerships in Learning for Utmost Success (PLUS). *Journal of Nursing Education, 38*, 188-192.

Lopez, R. (1992). A comparison of generic graduates, dropouts and current nursing students in a nursing education program: The influence of selected demographic, academic, and personal characteristics and accessibility variables (Doctoral dissertation, University of San Francisco). *Dissertation Abstracts International, 54-02B*, 0729.

Luepker, R. V., Murray, D. M., Jacobs, D. R., Mittlemark, M. B., & Bracht, N. (1994). Community education for cardiovascular disease prevention: Risk factor changes in the Minnesota Heart Health Program. *American Journal of Public Health, 84*, 1385-1393.

Maibach, E., Flors, J., & Nass, C. (1991). Changes of self-efficacy and health behaviors in response to a minimal contact community health campaign. *Health Communication, 3*, 1-15.

Marrello, C. C. (1999). The effects of an integrated reading and writing curriculum on academic performance, motivation, and retention rates of under-prepared college students (Doctoral dissertation, University of Maryland, College Park). *Dissertation Abstracts International, A60-4*, 999.

McCloskey, J., & Grace, H. (1994). *Current issues in nursing* (4th ed.). St. Louis: Mosby.

McGinty, D. (1989). A path analysis of the effects of multiple programs on student persistence (Doctoral dissertation, University of Texas-Austin, 1989). *Dissertation Abstracts for Social Sciences, 51*, DA9016936.

McGregor, A. J. (1996). *The professional socialization of nursing students: Failure as a social construction.* Unpublished doctoral dissertation, University of Toronto, Toronto, Canada.

Mohammadi, J. (1996). Exploring retention and attrition in two-year public community college. *Virginia Community College Association Journal, 10*(1), 39-50.

Moore, L. (1990). *Evolving theoretical perspectives on students: New directions for student services, No. 51.* San Francisco: Jossey- Bass.

Morey, A. I. (1997). Organizational change an implementation strategies for multicultural infusion. In A. Morey & M. Kitano (Eds.), *Multicultural course transformation in higher education* (pp. 258-277). Boston: Allyn and Bacon.

Morey, A. I., & Kitano, M. K. (Eds.). (1997). *Multicultural course transformation in higher education.* Boston: Allyn and Bacon.

Mow, S. L., & Nettles, M. T. (1996). Minority student access to, and persistence and performance in, college: A review of the trends and research literature. In C. Turner, M. Garcia, A. Nora, & L. I. Rendon, (Eds.), *Racial and ethnic diversity in higher education* (pp. 594-617). Needham Heights, MA: Simon and Schuster.

Murdock, S. H. (1995). *An America challenged: The implications of population change for America's future*. Boulder, CO: Westview Press.

Murdock, S. H., & Hoque, M. N. (1997). *The Texas challenge: Population change and the future of Texas*. College Station, TX: A&M University Press.

Murdock, S. H., & Hoque, M. N. (1999). Demographic factors affecting higher education in the United States in the twenty-first century. In G. H. Gaither (Ed.), *Promising practices in recruitment, remediation, and retention* (pp. 5-14). San Francisco, CA: Jossey-Bass.

National Center for Higher Education Statistics. (1996). *Remedial courses in higher education, the fall of 1995*. Washington, DC: U.S. Office of Education, Office of Educational Research and Improvement.

Nelson, R. (1993). *The effect of SLS and 1122 faculty mentors on student performance*. Orlando, FL: Valencia Community College. (ERIC Document Reproduction Service No. ED 371 778)

Neville, E. M. (1993). An exploration of attrition, retention and predictors of success in associate degree nursing programs (Doctoral dissertation, University of Massachusetts). *Dissertation Abstracts International, 54-06A*, 2034.

Noel, B., Levitz, R. S., & Richter, R. J. (1999). Strategic moves for retention success. In G. H. Gaither (Ed.), *Promising practices in recruitment, remediation, and retention*. San Francisco: Jossey-Bass.

Nora, A. (1987). Determinants of retention among Chicano college students: A structural equation model. *Research in Higher Education, 26*(1), 31-59.

Nora, A. (1990). Campus-based programs as determinants of retention among Hispanic community college students. *Journal of Higher Education, 61*, 312-331.

Nora, A., Attinasi, L. C., & Matonak, A. (1990). Testing qualitative indicators of precollege factors in Tinto's attrition model: A community college population. *Review of Higher Education, 13*, 337-356.

Nora, A., Kraemer, B., & Itzen, R. (1998). *Persistence among nontraditional Hispanic college students: A causal model.* Paper presented at the Association for the Study of Higher Education, Albuquerque, NM, November 6-9, 1997. (ERIC Document Reproduction Service No. ED 415 824)

Nugent, K. E., Bradshaw, M. J., & Kito, N. (1999). Teacher self-efficacy in new nursing educators. *Journal of Professional Nursing, 15,* 229-237.

O'Bannion, T. (1997). *A learning college for the 21st century.* Phoenix: American Association of Community Colleges/ACE/Oryx.

Olivas, M. A. (1996). Indian, Chicano, and Puerto Rican colleges: Status and issues. In C. Turner, M. Garcia, A. Nora, & L. I. Rendon (Eds.), *Racial and ethnic diversity in higher education* (pp. 36-58). Needham Heights, MA: Simon and Schuster.

Pace, C. R. (1993). Forward. In W. T. Banta and Associates (Eds.), *Making a difference: Outcomes of a decade of assessment in higher education* (Foreword). San Francisco: Jossey-Bass.

Pajares, F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research, 62,* 307-332.

Pajares, F. (1996). Self-efficacy beliefs and mathematical problem solving of gifted students. *Contemporary Educational Psychology, 21,* 325-344.

Pajares, F., & Miller, M.D. (1994a). Mathematics self-efficacy and mathematics problem solving: Implications for using various forms of assessment. *Florida Educational Research Council, 26,* 33-56.

Pajares, F., & Miller, M. D. (1994b). Role of self-efficacy and self-concept beliefs in mathematical problem solving. *Journal of Educational Psychology, 86,* 193-203.

Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research.* San Francisco: Jossey-Bass.

Peter, C. K. (1996). *Evaluation of a learning assistance program for at-risk students.* (Doctoral dissertation, University of Southern California, 1996, UMI order #PUZ9720277)

Puksa, M. A. (1999). Nursing students' perceptions of teachers' collaborative teaching style and self-efficacy for collaborative learning (Master's thesis, University of Western Ontario, Canada). *Masters Abstracts International, 37/06,* 1820.

Rendon, L. (1996). From the Barrio to the academy: Revelations of a scholarship girl. In C. Turner, M. Garcia, A. Nora, & L. I. Rendon (Eds.), *Racial and ethnic diversity in higher education* (pp. 281-287). Needham Heights, MA: Simon and Schuster.

Rew, L. (1996). Affirming cultural diversity: A pathways model for nursing faculty. *Journal of Nursing Education, 35*, 310-314.

Rosen, L. M. (1999). Associate and baccalaureate degree final semester students' perceptions of self-efficacy concerning community health nursing competencies (Doctoral dissertation, Widener University School of Nursing). *Dissertation Abstracts International, B60/01*, 132.

Rotter, J. B. (1966). Generalized expectancy for internal versus external control of reinforcement. *Psychological Monographs, 80*(1).

Roueche, J. E., & Roueche, S. (1993). *Between a rock and a hard place: At-risk students and the open door college.* Washington, DC: Community College Press.

Roueche, J. E., & Roueche, S. (1999). *High stakes, higher performance: Making remediation work.* Washington, DC: American Association of Community Colleges.

Rubino, N. D. (1998). An analysis of pre-admission test scores and their relationship to successful outcomes in the associate degree nursing program for students in Wesley College (Doctoral dissertation, Wilmington College, Wilmington, DE). *Dissertation Abstracts International, 58-08B*, 4146.

Rummel, A., Acton, D., Costello, S., & Pielow, G. (1999). Is all retention good? An empirical study. *College Student Journal, 33*, 241-246.

Sandler, M. E. (1998). *Career decision-making self-efficacy model and an integrated model of student persistence.* Paper presented at the annual meeting of the American Educational Research Association, San Diego, April 13-17, 1998. (ERIC Document Reproduction Service No. ED 419 209)

Schreibner, C. (2000). The shortage issue. *California Edition Nurse Week, 13*(4), 34.

Schreibner, N. L. (1995). Contribution of explanatory style and other personal attributes to measures of retention and success in baccalaureate nursing students (Doctoral dissertation). (Accession number 1998072019, UMI Order # PUZ9517202)

Schunk, D. H. (1995). Self-efficacy in education and instruction. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment theory: Theory, research, and application* (pp. 281-303). New York: Plenum.

Schunk, D. H., & Rice, J. M. (1993). Strategy fading and progress feedback: Effects on self-efficacy and comprehension among students receiving remedial reading services. *Journal of Special Education, 27*, 257-230.

Seidman, A. (1989). Recruitment begins with retention: Retention begins with recruitment. *Colleague* (State University of New York), 40-45.

Seidman, A. (1991). The evaluation of a pre/post admissions/counseling process at a suburban community college: Impact on student satisfaction with the faculty and the institution, retention, and academic performance. *College and University, 66,* 223-232.

Seidman, A. (1993). Wanted: A research methodology to assess community college effectiveness. *Community College Journal, 63*(5), 36-40.

Seidman, A. (1995). *Parkland College enrollment management model.* Champaign, IL: Parkland College. (ERIC Document Reproduction Service No. ED 384 375)

Seidman, A. (1996). Retention revisited: R = E, Id + E and In, Iv. *College and University, 71,* 18-20.

Seidman, A. (2000). Slide presentation of student retention and persistence for colleges. Available: http://www.collegeways.com/SmallCollegePresentation2000_files/frame.html

Smith, R. J., Arnkoff, D. B., & Wright, T. L. (1990). Test anxiety and academic competence: A comparison of alternative models. *Journal of Counseling Psychology, 37,* 313-321.

Sperry, R. W. (1993). The impact and promise of the cognitive revolution. *American Psychologist, 48,* 878-885.

Stage, F. K. (1996). Research on college students: Commonality, difference, and direction. In C. Turner, M. Garcia, A. Nora, & L. I. Rendon (Eds.), *Racial and ethnic diversity in higher education* (pp. 618-624). Needham Heights, MA: Simon and Schuster.

Stevens, B. B. (1996). A study of the relationship of faculty qualifications and program attributes and student outcomes in school of nursing in West Virginia from 1985 to 1994 (Doctoral dissertation, West Virginia University). *Dissertation Abstracts International, 57-12B,* 7456.

Terenzini, P. (1987). *Studying student attrition and retention: A primer on institutional research.* Washington, DC: United States Association of Institutional Research.

Tierney, W. G. (1992). *Official encouragement, institutional discouragement: Minorities in academe—The Native American experience.* Norwood, NJ: Ablex.

Tierney, W. G. (1996). An anthropological analysis of student participation in college. In C. Turner, M. Garcia, A. Nora, & L. I. Rendon (Eds.), *Racial and ethnic diversity in higher education* (pp. 624-634). Needham Heights, MA: Simon and Schuster.

Tinto, V. (1982). Limits of theory and practice in student attrition. *Journal of Higher Education, 53,* 687-700.

Tinto, V. (1993). *Leaving college: Re-thinking the causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.

Tinto, V. (1998). Colleges as communities: Taking research on student persistence seriously. *The Review of Higher Education, 21*(6), 167-177.

Tolland, F. D. (1990). A comparison of selected non-intellective characteristics of achieving and non-achieving women in associate degree nursing programs (Doctoral dissertation, Boston University, Boston, MA). *Dissertation Abstracts International, 51-01A,* 62.

Vincent, J. E. (1992). Exploration of selected academic and demographic factors influencing attrition and retention of baccalaureate nursing students (Doctoral dissertation, Ball State University). *Dissertation Abstracts International, 54-04B,* 1896.

Voorhees, R. A. (1985). Student finances and campus-based financial aid: A structural model analysis of persistence of high need freshman. *Research in Higher Education, 22,* 65-92.

Voorhees, R. A. (1987). Toward building models of community college persistence: A logit analysis. *Research in Higher Education, 26*(2), 115-129.

Wallin, D. L. (1997). The community college curriculum. In A. Morey & M. Kitano (Eds.), *Multicultural course transformation in higher education* (pp. 229-241). Boston: Allyn and Bacon.

Warkentin, R. W. (1994). *The relationship between college students study activities, content knowledge structure, academic self-efficacy and classroom achievement.* Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, April 4-8, 1994. (ERIC Document Reproduction Services No. ED 374 152)

Watkins, M. P. (1997). Perceived impact of nursing faculty on the academic success of minority students. *ABNF Journal, 8*(6), 125-128.

Weinstein, C. (1998). The impact of course in strategic long-term retention of college students. In J. Higbee & P. Dwinnel (Eds.), *Developmental education: Preparing successful college students* (pp. 1-33). Columbia, SC: National Resource Center for the First Year Experience and Students in Transition.

Williams, J. K. (1994). *The relationship between nursing program student attrition and selected variables* (Doctoral dissertation, University of Mississippi). (Accession number 1998072074, Order number #PUZ9521967)

Windham, P. (1994). *The relative importance of selected factors to attrition at public community colleges.* Paper presented at the Annual Conference of the Southwestern Association for Community Colleges, August 1-3, Savannah, GA. (ERIC Document Reproduction Service No. ED 378 833)

Zimmerman, B. J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*, 329-339.

Zimmerman, B. J. (1990). Self-regulating academic learning and achievement: The emergence of a social cognitive perspective. *Educational Psychology Review, 2*, 173-201.

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal, 29*, 663-676.

Zimmerman, B. J., & Ringle, J. (1981). Effects of model persistence and statements of confidence on children's self-efficacy and problem solving. *Journal of Educational Psychology, 73*, 485-493.

APPENDICES

APPENDIX A

CONSENT AND HUMAN RIGHTS FORMS

USC

(Date)

University Park IRB
University of Southern California
(ADM) Room 300

Los Angeles, California 90089-0031

Dear Dr. Sir or Madam:

The following packet is an application for expedited review for Human Subjects Research. The committee chairperson for this research is Dr. Linda Hagedorn and my name is Margaret Wilson, graduate student in the Rossier School of Education. This research will fulfill requirements for the EdD in higher education leadership. This dissertation topic concerns the retention of student nurses in community college programs.

The need for expedited review occurs due to my collection of data from past student records obtaining the students' pre-nursing science GPA, High School GPA, Math and Reading assessment test scores. The research also involves non-intellective variables as well as the community college/nontraditional student concerns and self-efficacy. Submission of qualifying exam is completed and oral defense of proposal is scheduled November 30, 2000. Pending approval of this Human Subjects review, the potential dates for collection of data from students are January 2001 through May 2001.

Thank you for your time and consideration of this application. Please feel free to ask any questions concerning this research and Human Subjects Review.

Sincerely,
Margaret Wilson MSN, RN
Nursing Instructor-Cypress College

APPLICATION* FOR HUMAN SUBJECTS REVIEW

Title of Project:

Predicting Traditional/ Nontraditional Student Retention and Academic Achievement in Western United States Associate Degree Nursing Programs

Principal Investigator: Linda Serra Hagedorn Ph.D.

What School/Department: University of Southern CA
Rossier School of Education

Telephone # Principal Investigator: (213)-740-6777

Who will have contact with human subjects?
Graduate Student Margaret Wilson MSN, RN
(949)-856-6791
megwilson@home.com
5 Tamizar
Irvine California, 92620

Summarize the major objectives of the research:

Investigate a proposed model for prediction of nursing student academic achievement and retention as related to intellective, non-intellective and self-efficacy concepts. Investigate if traditional versus nontraditional students differ with this proposed model for prediction of nursing student academic achievement and retention as related to intellective, non-intellective and self-efficacy concepts.

Project Plan Fall 2000

Obtain agreement of departments of Nursing at Cypress College, Cerritos College, Long Beach City College, and Victor Valley College to do nursing student retention research on their incoming Freshman Students.

January-February 2001

Collect data from a convenience sample of volunteers within the first two weeks of their program start.

Assign anonymous codes to each student for confidentiality.

Obtain data on demographic data sheet. Administer to volunteer students two instruments (Self-Efficacy Tool and Student Perceptual Appraisal) that are the students own rated perceptions over self-efficacy and nontraditional variables impacting student persistence.

Retrieve (with students permission) from their existing records intellective variables of pre-nursing science GPA, High School GPA, remedial course completion, Math & Science Assessment Test score. Give confidential identifying names and matching code number to Nursing Program Director for later longitudinal follow-up.

March 2001 and May 2001

Contact Director of Nursing Program or designee to obtain students outcomes toward retention and academic achievement at week eight and sixteen of first semester.

Subjects in the study:

Approximately 150 first semester nursing students in community college programs. Some students may be pregnant; however, they will have completed a recent physical exam with their physician stating capacity to enroll and perform in class and clinical of a nursing program.

Risks to human subjects:

No obvious physical or emotional risks are anticipated to these subjects as they answer questionnaires. There will be no penalty for volunteering or choosing not to volunteer in this study. The subjects will complete an informed consent and their identity will be anonymous with use of code by the researcher.

Minimization of Risk:

The students will have their confidentiality and their schools confidentiality maintained throughout this study. The connecting identification of student name to coded data will be retained in the school by the director or designee at the end of the day when intellective variables are retrieved from the student file. The directors of these programs are masters and doctoral prepared RN's and fully understand the import of confidentiality on behalf of their students. To this end of confidentiality, a final statement by the researcher will be written into a letter of appreciation at the study completion in May 2001. This letter will also request the nursing program director to destroy connecting code and identity sheet from this study.

The potential publication or conference engagements where this data will be discussed will not reveal any individualized data. All scores and research measures will be averaged. Moreover, the name of the participating school held in confidence by this research to prevent any impact to individual students or schools.

Risk to Benefit Ratio:

The empirical evidence potentially gained toward nursing student retention gives the impression of being well worth the minimal confidentiality risk designed into this study. There is presently a nursing workforce shortage and an increase in nursing student attrition in community college programs. Greater than ever call for RN healthcare providers are predicted as the baby boomer generation reaches an age requiring more health care.

The potential model designed in this study if successful in prediction of student retention and academic achievement may provide assistance to:

- Educational counselors advising pre-nursing majors.
- College administrators determining programs of developmental education.
- Acceptance committees for development of admission requirements.
- Curricular committees deciding pedagogy to enhance student success.
- Faculty education in techniques of student self-efficacy development.

The increase of safe and effective RN graduates will serve the general welfare by providing adequate numbers of graduates to meet healthcare workforce demand.

CV's of investigators and advertisement for recruiting participants for this research are attached.

UNIVERSITY OF SOUTHERN CALIFORNIA
UNIVERSITY PARK
INSTITUTIONAL REVIEW BOARD
ADM 300 / MC 4019
Tel: (213) 740-6709
Fax: (213) 740-8919
MPA No. M-1299

UNIVERSITY OF SOUTHERN CALIFORNIA

UNIVERSITY OF SOUTHERN CALIFORNIA

Review of Research Involving Human Subjects
APPROVAL NOTICE

Date: **February 2, 2001**

Principal Investigator(s): **Linda S. Hagedorn, Ph.D. / Margaret Wilson, MSN, RN**

Project Title: **Predicting Traditional/Non-Traditional Student Retention and Academic Achievement in Western United States Associate Degree Nursing Programs**
USC UPIRB #01-01-004

The University Park Institutional Review Board has reviewed the information you submitted pertaining to the above proposal at its meeting of N/A and has:

		Educ	Psych	SocWk	Socio
☐	Approved study				
☑	Approved the Delegated Review	☑	☐	☐	☐
☑	Approved the Claim of Exemption				
☐	Approved continuation/amendment				
☑	Approved under the expedited review by the chair - 45 CFR 46.101 (b) (4)				

Conditions of Approval:

The Investigators must provide the following requested information prior to proceeding research (which includes contacting, recruiting, and enrolling potential subjects):

Please note: This Claim of Exemption Approval Notice is valid for the life of the study unless otherwise noted. An application for Continuing Review of a Claim of Exemption is not necessary unless there are changes to the study. In which case, an amendment to the original Claim of Exemption must be submitted to the UPIRB for review and approval.

NOTE: The IRB must review all advertisements and/or recruiting materials. Serious adverse events, amendments and/or changes in the protocol must be submitted to the UPIRB for approval. Changes may not be implemented until you have received the Board's approval. Exception: changes involving subjects' safety may be implemented prior to notification to the UPIRB.

Marlene S Wagner

Marlene S. Wagner, Ph.D., Chairperson

University of Southern California
Rossier School of Education

INFORMED CONSENT FOR NON-MEDICAL RESEARCH

****

CONSENT TO PARTICIPATE IN RESEARCH

Predicting Traditional/Nontraditional Student Retention and Academic Achievement in Western United States Associate Degree Nursing Programs

You are asked to participate in a research study conducted by Margaret Wilson, MSN, RN (graduate student) and Linda Serra Hagedorn, Ph.D. (Committee Chairperson and principal investigator), from the Rossier School of Education at the University of Southern California. This research will be a dissertation by Margaret Wilson toward a doctoral degree in higher education leadership. You were selected as a possible participant in this study because you are a beginning-nursing student. Retention of nursing students within their chosen major is of importance to community college educators and the public due to a current nursing shortage. A total of 150 subjects will be selected from beginning-nursing students in community colleges to participate. Your participation is voluntary.

☐ PURPOSE OF THE STUDY

The primary purpose of this study is to investigate beginning-nursing student traits that indicate successful completion in the healthcare major of nursing. There is presently a nursing workforce shortage. Nursing student retention is a complex group of factors and community college educators need guidance from research to develop programs toward student success.

☐ PROCEDURES

If you volunteer to participate in this study, the time to complete these questionnaires will be approximately 30-45 minutes. There will be no further requirements for you to do anything after questionnaires are completed. The time from start to finish for your involvement in this room will not be longer than one hour.

The research procedures you are asked to do are the following:

1. Complete a questionnaire describing you (age, sex, marital status, hours working, number of children, income).
2. Be assigned an anonymous code in the study.
3. Complete a questionnaire that describes common student traits (academic, environmental, and background qualities) and whether you think these qualities support or hinder your progress toward nursing studies.
4. Complete a questionnaire that describes your opinion of how confident you feel toward the clinical and class requirements in nursing that will occur this first semester.
5. Allow this investigator to obtain your pre-nursing science Grade Point Average (GPA), High School GPA, remedial courses completed, and community college entrance reading and math assessment test scores.
6. Allow this investigator to track your progress by an anonymous code through the first semester of this nursing program.

Your progress in the nursing program will be held confidential as to your name or any other identifying school numbers. This investigator will track your nursing program status by anonymous code identification and contact your nursing school director or faculty appointee at week eight and sixteen of this semester.

☐ POTENTIAL RISKS AND DISCOMFORTS

There are no obvious risks to you by participating in this study. No records of this study will ever be traceable to you personally or to your specific nursing school. Your answers will not be shared with faculty as individual responses. The publications from this study will protect your identity and will not effect your nursing program progression in any way.

☐ POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

The direct benefit from this study for you may be none as changes in school programs take some time to institute. You may be completed with your program by the time study results are available to college educators. The experience of being part of nursing research enhances your ability to understand the role of research subjects, their rights and a researchers responsibility. Students, like yourself, who volunteer for research are protected and treated confidentially. It is my hope this experience may increase your knowledge of the processes of scientific research involving human beings.

The potential benefits to society for your time, effort and cooperation in this research study are improvement within nursing programs that can assist students to remain in their chosen nursing major. It is my wish to enhance nursing educators knowledge of how students view themselves and what their confidence needs might be at the start of nursing studies. Possibly, this study when applied by nursing programs may increase in the number of nursing graduates and could help meet healthcare needs at this time of nursing workforce shortage.

☐ PAYMENT FOR PARTICIPATION

Your payment for participating in this research will be to receive a two-dollar token of appreciation for your time and effort. The payment will be in cash when the researcher receives you questionnaires at the front of the room.

This researcher will provide a lunch meal at the end of this session, as this researcher is aware you are on lunch break between class and on-campus lab.

If you choose to not participate, you will not receive the two dollars; however, you can return within 45-minutes, eat lunch and participate with your class group at the lunch meal.

☐ CONFIDENTIALITY

Any information that is obtained in connection with this study and that can be identified with you will remain strictly confidential and will be not be disclosed. You are protected by the human rights/research law from having any coded or connecting descriptive information, that could identify you individually, protected by this investigator, your director in this nursing program, or his/her faculty designee. The law states you must be contacted and give your consent to any release of personal information. The research design of this study has no plan to request or contact you in the future.

The matching student data that connects this confidential code to you and your records will be stored and held confidential by your director in the nursing program or his/her faculty designee. All of the participants in this study are protected by the researcher, nursing program director or faculty designee from exposure of individual responses or from negative effect due to participation in this study.

When the results of the research are potentially published or discussed in conferences, no information will be included that would reveal your identity. Your personal identity will be disguised and available to the researcher as a code; and your responses will be cumulatively added up and averaged further disguising any individual identity. The disguising codes and connecting student descriptive information collected during this study and held in confidence by your program director will be destroyed at the completion of this dissertation.

☐ PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you don't want to answer and remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so. The circumstances in which you would be removed from the study would be related to research mathematical procedures toward proper sample collection and statistical calculation.

☐ IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact:

Graduate Student Investigator	Margaret Wilson MSN, RN (949)-856-6791 megwilson@home.com 5 Tamizar Irvine California, 92620
Faculty Sponsor/Chairperson	Linda Serra Hagedorn Ph.D. (213)-740-6777 lsh@usc.edu University of Southern CA Rossier School of Education Waite Phillips Hall Building Room 800 Los Angeles, California 90089-0031

☐ RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact the University Park IRB, Office of the Vice Provost for Research, Bovard Administration Building, Room 300, Los Angeles, CA 90089-4019, (213) 740-6709 or upirb@usc.edu.

Retention of Student Nurses
Research Consent Form

SIGNATURE OF RESEARCH SUBJECT, PARENT OR LEGAL REPRESENTATIVE.

I understand the procedures described above. My questions have been answered to my satisfaction, and I agree to participate in this study. I have been given a copy of this form.

Name of Subject

Name of Parent or Legal Representative (if applicable)

Signature of Subject, Parent or Legal Representative Date

SIGNATURE OF INVESTIGATOR

I have explained the research to the subject or his/her legal representative, and answered all of his/her questions. I believe that he/she understands the information described in this document and freely consents to participate.

Name of Investigator

Signature of Investigator Date
(must be the same as subject's)

Retention of Student Nurses

Sample Agreement Form for Research at School of Nursing

Participant Schools of Nursing have been given agreement for their confidential identity and have all signed the following consent form, which is on file with the researcher.

Dear Director/Dean;

The following is an agreement to allow Margaret Wilson and her Chairperson Dr. Linda Sera Hagedorn access to do a doctoral research study with RN Nursing students at your college____(Name Of College)________. The name of the research is "Predicting student nurse retention in Western United States Associate Degree Nursing Programs". A copy of this proposed study has been given to you and your nursing faculty designee ____ (Name of Faculty Contact Designee)____. Our planned arrangements for this research are the Spring of 2001 semester at the convenience of the faculty and students.

I _(Name of Dean/Director)__agree to this research at _(Name of College).

Signature:____

BMDS Behavioral **Measurement** Database Services

Health and Psychosocial Instruments (HaPI)

Director: Evelyn Perloff, PhD
Behavioral Measurement
Database Services

HaPI Advisory Board

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Harvard University Graduate School of Business Administration

Stephen J. Zyzanski, PhD
Case Western Reserve University School of Medicine

To: **Ms. Meg Wilson**
From: **Evelyn Perloff, PhD**

Date: **August 10, 2000**

Enclosed is the:

Self-Efficacy Tool
M. R. Jeffreys

Student Perception Appraisal
M. R. Jeffreys

As I have indicated authors like to receive feedback on your study. All that is asked is that you provide a brief summary of your findings upon completion of your study/project. In addition, we encourage you to send a full report which we will consider for inclusion in Health and Psychosocial Instruments (HaPI) and which you may list on your vita/resume.

Enclosed also is an invoice. It covers the cost (e.g., handling, postage, and copyright fee) for these instruments.

Please note that the instruments are for a single study only. It is, of course, necessary to provide the appropriate title and author credit in reproduced material and in your report.

PO Box 110287 • Pittsburgh, PA 15232-0787
Phone: 412-687-6850 Fax: 412-687-5213 E-mail: bmdshapi@aol.com

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APPENDIX B

DATA COLLECTION INSTRUMENT

RETENTION of STUDENT NURSES

DEMOGRAPHIC DATA SHEET

Directions: Darken in on your Scantron the number which best describes or represents your present demographic status:

1) Sex
    1) Male
    2) Female

2) Age
    1) under 21 years
    2) 21 to 25 years
    3) 26 to 30 years
    4) 31 to 35 years
    5) 36 to 40 years
    6) 41 to 50 years
    7) 51 years or older

3) Marital Status:
    1) Single
    2) Single living with partner
    3) Single living with parents
    4) Married
    5) Married living with parents or extended family
    6) Divorced
    7) Widowed

4) Ethnic/Racial Background:
    1) White, (non-Hispanic)
    2) Hispanic
    3) Black
    4) Native American
    5) Asian
    6) Pacific Islander
    7) Other (Please Specify)______________________

5) What is your first and primary use language?
    1) English
    2) Spanish
    3) Chinese
    4) Japanese
    5) Vietnamese
    6) Philippine
    7) Pharisee
    8) Other (Please Specify)_________________________

6) Country/Region of your birth:
  1) United States
  2) Mexico
  3) Vietnam
  4) Philippines
  5) Central or South America
  6) European Country
  7) Africa
  8) Other (Please Specify)________________________

7) Number of dependent children living with you:
  1) None
  2) 1
  3) 2
  4) 3
  5) 4
  6) 5 or more

8) Family income range in approximate dollars per year:
  1) 0 to 10, 000
  2) 10,001 to 20,000
  3) 20,001 to 30,000
  4) 30,001 to 40,000
  5) 40,001 to 50,000
  6) Over 50,000

9) Miles commuted one way to community college school site:
  1) 0 to 10
  2) 11 to 20
  3) 21 to 30
  4) 31 to 40
  5) 41 to 50
  6) Over 50 miles

10) Number of hours in paid job employment done outside your home per week:
  1) Zero (0)
  2) 1 to 10
  3) 11 to 20
  4) 21 to 30
  5) 31 to 40
  6) Over 41 hours per week

11) Number of hours caring for elders or extended family per week:
  1) Zero (0)
  2) 1 to 5
  3) 6 to 10
  4) 11 to 15
  5) 16 to 20
  6) 21 to 25
  7) Over 25 hours

Please darken in on your survey your best recollection of information describing you academically before your program entrance:

12) High School Grade Point Average:
   1) Below 2.0
   2) 2.0 to 2.5
   3) 2.6 to 2.9
   4) 3.0 to 3.5
   5) 3.6 to 3.9
   6) 4.0 or higher (AP course work averages > 4.0)

13) Pre-Nursing GPA in anatomy and physiology courses:
   1) D- to D+ 2) C- to C+ 3) B- to B+ 4) A- to A+

14) Math assessment test results done on entrance to community college:
   1) Below college level - multiple developmental/remedial courses needed
   2) At College Level- Developmental courses such as college level algebra or health science math required
   3) Above college pre-requisite math needed for nursing major
   4) SAT/ACT advanced placement college credit granted for math courses above pre-requisites in nursing major
   5) Prior college coursework credit at or above nursing major college requirements

15) Reading/English comprehension assessment prior to college entrance:
   1) Below college level skill- multiple developmental/remedial courses in English or reading required
   2) At college level- developmental courses at college credit level in English required
   3) Above level for pre-requisite nursing course English requirement
   4) SAT/ACT advanced placement course credit granted in college level course
   5) Prior college course credit above pre-requisite English/communication coursework requirements for nursing major.

16) Remedial Coursework in Mathematics advised:
   1) None required
   2) Never assessed or advised
   3) Course advised and not taken (Please specify why not taken)

   ____

   4) Courses taken (Please specify number of courses and times taken to pass)

   ____

17) Remedial coursework in Reading advised:
    1) None required
    2) Never assessed or advised
    3)Course advised and not taken (Please specify why not taken)

    ____

    4) Courses taken (Please specify number of courses and times taken to pass)

    ____

18) Remedial coursework in Spoken English Communication Advised:
    1) None required
    2) Never assessed or advised
    3)Course advised and not taken (Please specify why not taken)

    ____

    4) Courses taken (Please specify number of courses and times taken to pass)

    ____

19) Number of times Anatomy and Physiology course(s) repeated to attain pre-nursing science GPA:

    1) Placed out of anatomy requirements before Community entrance
    2) Courses taken one time only- No Repetitions required to attain Pre-Science GPA for nursing major
    3) Courses repeated times One (1)
    4) Course repeated times two (2) to meet nursing requirements
    5) Courses repeated times three (3) or more to meet nursing major requirements
    6) Other (Please specify)______________________________________

(Prepared by Margaret Wilson.)

APPENDIX C

SELF-EFFICACY STRENGTH TEST

Self-Efficacy Tool

M. R. Jeffreys

Going to school is only part of your life. **YOU** may have other roles and responsibilities that will compete with school.

What do YOU expect to learn to do in the clinical area by the end of the semester despite any other roles, responsibilities, personal obstacles, or hardships? Will **YOU** give whatever energy it takes to accomplish this learning.

Rate YOUR degree of confidence in accomplishing this learning. Choose a number from (1) to (6) using the scale below and mark your Scantron with your numbered response. Make all makings for this questionnaire on the Scantron form provided.

1-A little confidant	4-Very confidant
2-Somewhat confident	5-Virtually certain
3-Rather confident	6-Absolutely certain

Communication

1. Introduce yourself to other members of the health care team

1 A little confident	2 Somewhat confident	3 Rather confident
4 Very confident	5 Virtually certain	6 Absolutely certain

2. Introduce yourself to a patient

1 A little confident	2 Somewhat confident	3 Rather confident
4 Very confident	5 Virtually certain	6 Absolutely certain

Interview a patient about:

3. His/Her health problems

1 A little confident	2 Somewhat confident	3 Rather confident
4 Very confident	5 Virtually certain	6 Absolutely certain

4. Medications taken at home

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

5. Changes related to age

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

6. Ethnic food preference

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

7. Religious practices and beliefs

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

8. Emotional concerns

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

9. Financial concerns

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

10. Alcohol and drug use

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

Technical Skills

11. Make an unoccupied bed

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

12. Make an occupied bed

1 A little confident   2 Somewhat confident   3 Rather confident
4 Very confident   5 Virtually certain   6 Absolutely certain

13. Assist a patient with eating

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

14. Assist a patient to the bathroom

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

15. Reposition a patient who is confined to bed

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

16. Provide a bed bath for a patient of your sex

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

17. Provide a bed bath for a patient of the opposite sex

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

18. Assist a patient with the bedpan

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

19. Apply hot or cold packs

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

20. Perform sterile dressing change

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

21. Clean surgical wound using sterile technique

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

22. Reapply restraints to a confused patient

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

Physical Assessment

Accurately assess:

23. oral temperature

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

24. rectal temperature

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

25. pulse

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

26. respirations

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

28. skin

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

29. ability to move

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

30. mental status

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

31. bowel sounds

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

32. breathe sounds

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

Medications

Administer:

33. oral medications

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

34. skin creams and ointments

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

35. eye drops

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

36. eardrops

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

37. oxygen

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

38. injections

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

39. intravenous medications

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

Teach patient about:

40. preventing the spread of infection

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

41. diet

1 A little confident
2 Somewhat confident
3 Rather confident
4 Very confident
5 Virtually certain
6 Absolutely certain

42. changes occurring with the aging process

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

43. effects of smoking on health

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

44. medications

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

45. performing a dressing change

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

46. administering injections to self

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

Collaboration

Discuss plan of care with:

47. staff nurses

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

48. patient

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

49. patient's family

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

50. dietitian

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

51. social worker

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

52. physician

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

Documentation

53. Record temperature, pulse, and respirations in chart

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

54. Record a blood pressure in chart

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

55. Complete a patient's checklist in chart

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

56. Write about patient's condition in chart

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

57. Develop a written plan of patient care

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

Professional Development

58. Describe role of registered nurse

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

59. Protect rights of patients

1 A little confident 2 Somewhat confident 3 Rather confident
4 Very confident 5 Virtually certain 6 Absolutely certain

Other

60. Interpret physical exam report

1 A little confident	2 Somewhat confident	3 Rather confident
4 Very confident	5 Virtually certain	6 Absolutely certain

(As directed from the author M. R. Jeffreys these self-efficacy tools were taken from Behavioral Measurement Database Services. see verification of permission Appendix A page 166. Originally published within, "The relationship of self-efficacy and select academic variables on environmental variables on academic achievement and retention,"by M.R. Jeffreys, 1993. (Doctoral dissertation, Columbia University, Teachers College, 1993). *Dissertation Abstracts International, 54-08B*, 4079-00188.)

EDUCATIONAL REQUIREMENTS SUBSCALE

M. R. Jeffreys

Going to school is one part of your life. YOU may have many other roles, responsibilities, personal obstacles, or hardships! Will YOU give whatever energy it takes to perform these tasks?

Rate YOUR degree of confidence in performing these tasks. Using the scales below, choose a number from (1) not confident to (10) totally confident and mark on your Scantron that corresponding number that represents your response.

61. Attend all classes

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

62. Attend all nursing skills laboratories

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

63. Attend all clinical laboratories

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

64. Complete all assigned readings on time

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

65. Complete all computer programs on time

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

66. Review class notes after each class

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

67. Complete assigned papers on time

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

68. Study adequately before exams

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

69. Obtain a passing grade for clinical laboratory

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

70. Obtain a "B" grade for this course

Not confident 1… 2…3…4…5…6…7…8…9…10 Totally confident

(As directed from the author M. R. Jeffreys these self-efficacy tools were taken from Behavioral Measurement Database Services, see verification of permission Appendix A page 166. Originally published within, "The relationship of self-efficacy and select academic variables on environmental variables on academic achievement and retention,"by M.R. Jeffreys, 1993. (Doctoral dissertation, Columbia University, Teachers College, 1993). *Dissertation Abstracts International, 54-08B*, 4079-00188.)

APPENDIX D

STUDENT PERCEPTUAL APPRAISAL

STUDENT PERCEPTION APPRAISAL

Environmental Impact (Bean & Metzner Tool)

Adapted by M. R. Jeffreys

PART 1: Evaluate each item in terms of how it may affect YOUR ability to achieve at least a 'B' in nursing this semester.

Using the scale below, choose a number from (1) to (6) for each item and fill in the corresponding number on you scantron for that item:

1- Does not apply	4- Does not restrict or support
2- Severely restricts	5- Moderately supports
3- Moderately restricts	6- Greatly supports

20) Personal study skills

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

21) Faculty advisement and helpfulness

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

22) Transportation arrangements

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

23) Financial status

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

24) Class Schedule

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

25) Family financial support

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

26) Hours of employment

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

27) Personal study hours

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

28) College library facilities

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

29) Family emotional support

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

30) Family crisis

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

31) Employment responsibilities

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

32) Nursing skills laboratory facility

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

33) College tutoring facilities

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

34) College counseling services

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

35) Family responsibilities

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

36) Financial aid and/or scholarship

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

37) Encouragement by friends outside of school

Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

38) Encouragement by friends within classes

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

39) Computer laboratory facility

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

40) Child care arrangements

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

STUDENT PERCEPTION APPRAISAL

M. R. Jeffreys

PART 1: Evaluate each item in terms of how it may affect YOUR ability to remain in nursing this semester.

Using the scale below, choose a number from (1) to (6) for each item and fill in the corresponding number on you scantron for that item:

1- Does not apply

2- Severely restricts

3- Moderately restricts

4- Does not restrict or support

5- Moderately supports

6- Greatly supports

71) Personal study skills

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

72) Faculty advisement and helpfulness

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

73) Transportation arrangements

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

74) Financial status

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

75) Class Schedule

1 Does not apply 2 Severely restricts 3 Moderately restricts

4 Does not restrict or support 5 Moderately supports 6 Greatly supports

76) Family financial support

1 Does not apply   2 Severely restricts   3 Moderately restricts

4 Does not restrict or support   5 Moderately supports   6 Greatly supports

77) Hours of employment

1 Does not apply   2 Severely restricts   3 Moderately restricts

4 Does not restrict or support   5 Moderately supports   6 Greatly supports

78) Personal study hours

1 Does not apply   2 Severely restricts   3 Moderately restricts

4 Does not restrict or support   5 Moderately supports   6 Greatly supports

79) College library facilities

1 Does not apply   2 Severely restricts   3 Moderately restricts

4 Does not restrict or support   5 Moderately supports   6 Greatly supports

80) Family emotional support

1 Does not apply   2 Severely restricts   3 Moderately restricts

4 Does not restrict or support   5 Moderately supports   6 Greatly supports

81) Family crisis

1 Does not apply   2 Severely restricts   3 Moderately restricts

4 Does not restrict or support   5 Moderately supports   6 Greatly supports

80) Employment responsibilities

1 Does not apply   2 Severely restricts   3 Moderately restricts

4 Does not restrict or support   5 Moderately supports   6 Greatly supports

83) Nursing skills laboratory facility

1 Does not apply   2 Severely restricts   3 Moderately restricts

4 Does not restrict or support   5 Moderately supports   6 Greatly supports

84) College tutoring facilities

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

85) College counseling services

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

86) Family responsibilities

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

87) Financial aid and/or scholarship

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

88) Encouragement by friends outside of school

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

89) Encouragement by friends within classes

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

90) Computer laboratory facility

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

91) Child care arrangements

1 Does not apply 2 Severely restricts 3 Moderately restricts
4 Does not restrict or support 5 Moderately supports 6 Greatly supports

(As directed from the author M. R. Jeffreys these self-efficacy tools were taken from Behavioral Measurement Database Services, see verification of permission Appendix A page 166. Originally published within, "The relationship of self-efficacy and select academic variables on environmental variables on academic achievement and retention,"by M.R. Jeffreys, 1993. (Doctoral dissertation, Columbia University, Teachers College, 1993). *Dissertation Abstracts International, 54-08B*, 4079-00188.)

APPENDIX E

OUTCOMES INVENTORY FORM

RETENTION OF STUDENT NURSES

NAME:______________________________

STUDENT ID NUMBER:________________________

CODE ON STUDY SCANTRON:____________________

OUTCOMES WEEK EIGHT OF FIRST SEMESTER:

1. First eight weeks course grade ____________

2. Retention Status: Retained ____________
   Withdrawn ____________

   Reason(s): Academic Failure __________
   Clinical Failure __________
   Personal Crisis/Illness __________
   Family Crisis/Illness __________
   Dislike of Nursing __________

3. Unusual outcome/circumstances not listed:

   ____

OUTCOMES SECOND EIGHT WEEKS OF THE SEMESTER:

1. First eight weeks course grade ____________

2. Retention Status: Retained ____________
   Withdrawn ____________

   Reason(s): Academic Failure __________
   Clinical Failure __________
   Personal Crisis/Illness __________
   Family Crisis/Illness __________
   Dislike of Nursing __________

3. Unusual outcome/circumstances not listed:

   ____

(Prepared by Margaret Wilson.)